

AGRICULTURAL HISTORY

EVERETT E. EDWARDS
Editor

VOLUME 16
1942

THE AGRICULTURAL HISTORY SOCIETY

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THE STORY OF RILEYVILLE, NEW JERSEY

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Recent road maps do not give the location of Rileyville, New Jersey, but old atlases will. It was located on the top of Sourland Mountain, northwest of the village of Hopewell. The adjacent valley was settled before the Revolutionary War, and soon thereafter the steep, rocky slopes of the "Mountain" were occupied. The oaks, elms, and hickories around Rileyville were last to give way to settlement, not because the land on the mountain top was considered less favorable for agriculture, but because it was too far from the valley.

The pioneers on the Mountain were of English, Irish, and Dutch extraction; early inhabitants had such names as Isaac Riley, Jacob Wilson, Isaac Horn, Ira Stout, William Woodruff, and John Snook. Members of the second and third generation, many of them young at the time of the Civil War, found the Mountain all that their fathers and grandfathers believed it would become—an area producing a modest but comfortable living for thrifty, energetic farmers. Large families were common, and with the willing cooperation of all the members, the land returned as much as most contemporary farms in the way of a standard of living.

The farms were usually of less than 100 acres, with not more than three-quarters of the land cleared. The fields were small, usually from 1 to 10 acres, strewn not only with huge boulders but with countless smaller stones, which, even in 1900, literally covered the surface, despite the fact that most of the fields were already surrounded by stone hedges several feet high and as wide—the fruit of long, back-bending labor. The clearings did not follow any uniform pattern as to size, shape, or location; these important details of farm management were usually entirely dependent upon slope, boulders, stone, and drainage. With tools, such as the hoe, the walking plow, the one-horse cultivator, and the cradle, the long work day, and many willing hands, these wretched fields were brought to support farm families.

Communication with the railroad towns of Hopewell to the southeast and Ringoes to the west, both 3 to 4 miles distant, was over rough dirt roads. A horse-and-buggy journey down the Mountain took from one to two hours; a round trip with stops at two or three stores in the village usually required half a day even during the summer months; in the winter, early spring, and late fall, the ride was not a pleasant prospect; snow and deeply rutted roads, frozen or covered with mud, lengthened the journey, while the driver was chilled despite side curtains, heavy mittens, felt boots, and lap robes. During the spring thaw the roads were nearly impassable even for buggies, and the farmers were often

snowbound for days. The tediousness of trips to town was compensated by the interchange of greetings with all passersby, friends or strangers.

The long trip to town created a local distributing center. In a hollow near the Riley farm a general store was established and the place named Rileyville. The store was the post office and retail center for an area about 2 miles in diameter; a walk of not over three-quarters of an hour supplied most daily needs.

The Rileyville store was more than just a store; it was the community center. Here news of the world and local gossip was impartially dispensed; and advertisement of a social or religious event required just one notice. The ladies and children frequented it during the day; in the evening, one could always find a small group of farmers and older boys, sitting around the stove in the winter or on the porch in the summer.

To purchase "store clothes," furniture, and bulk supplies such as feed and fertilizer, Rileyville traded at irregular intervals in the railroad towns. Many bulk sales of grain and hay were consummated there also, but such produce as chickens, eggs, butter, and wild berries were usually exchanged for daily supplies at the general store. Livestock was sold to traveling stock buyers. Mail-order purchasing was not widely used even when it became available because the local storekeeper was also the postmaster; few citizens cared to upset the amiable relations with their storekeeper-friend by buying from his price-cutting competitors under his very nose.

Obviously, the poor roads and the inadequate conveyances of that day made it impossible for the farm children to attend a village school, even if it had been considered desirable. The inhabitants generally believed that the little red, one-room school, known as "Tidd's School," with its thirty odd pupils met the educational needs of the day. Certainly it cost very little to operate: a minimum of repair, one teacher's salary, and the cost of coal for the big iron stove that stood in the center of the room. The boys could attend in overalls and barefooted, which even then was not considered the most fitting attire at the village schools in the vicinity. The teacher would also understand if they were kept out of school for a time to help with planting or late harvest. The children walked to school, in some cases as much as 3 miles, carrying their lunches in little tin pails, and helped morning and night with the chores at home. Nevertheless, the school day was longer than in the villages and hence, the term shorter so that the children had a longer "vacation" in which to help at home. Tidd's School not only served as a center for youth activities and the dissemination of neighborhood gossip, but at frequent intervals entertainments brought parents and friends to the school grounds.

The church was the third welder of community solidarity. It was known as the Mountain Christian Church and had no regular pastor or dogma. Its Sunday services were held at whatever hour a minister from one of the village churches could be secured. Often, however, the farmer deacons led their own services. The church served a wider community than the store and the school, communicants driving in as much as 5 miles; there were few churches in the

countryside and some farmers living close to the villages preferred to associate with their kind at the rural church. Nevertheless, the Mountain Christian Church did not exert as much influence in the community as the store and the school, probably because of the greater formality of its gatherings, the larger group, the irregular attendance of some of the neighbors, and the lack of a resident pastor.

The final community institution was Runyan's blacksmith shop. Here one could usually find several farmers pleasantly visiting while their horses were being shod by the talkative, congenial smith. Often a customer felt aggrieved if the blacksmith was able to serve him immediately! There were also two other establishments that, while not clearly community institutions, did aid in solidarity; Riley's applejack distillery, home of the famed "Jersey lightning," and Snook's cider and vinegar works.

These institutions and industries were scattered rather than grouped in the center of the community. The location of the store, blacksmith shop, and other establishments represented the judgment of the founders and the availability of a site. The general store served a much smaller area than the smithy, because of more competition and because it was partly dependent on pedestrian trade. The blacksmith shop, the distillery, and the cider works served more than the Rileyville community. The school was located by the people as centrally as possible in reference to the homes and neighboring schools, while the church owed its site in part to a donation of land by an interested farmer.

Rileyville is pictured in the previous paragraphs as it was near the end of the nineteenth century, a pleasant and homogeneous hamlet nestled in the hills of New Jersey midway between New York and Philadelphia. It was a true community. Its economic life and an important part of its social activity centered in the general store and blacksmith shop. Other activities found their outlet in its school while the religious urge was satisfied by the nonsectarian church. It was not a political unit because the boundary line between Hunterdon and Mercer counties bisected the area.

After the turn of the century, a series of events, some distant and some nearby, eliminated farming in the community and changed the entire economic and social pattern. The identity of Rileyville was destroyed. The developments complemented rather than counteracted each other, accentuating and hastening the changes.

The soil at Rileyville, never very fertile, gradually became less productive because of sheet erosion and faulty husbandry. At the same time, while the output per unit of labor and capital was on the decline, western crops, aided by the Panama Canal, truck transportation, and refrigerator cars, captured Rileyville's markets. The binders, planters, hay loaders, combines, tractors, and gang plows also worked to the advantage of the western competitors. The Rileyville farmers were too poor to purchase these tools; their fields were small and steep, with too many boulders and stones for the economical operation of mechanized farm equipment. Some clearings were not much larger than the area required

for turning the larger machines around. In an effort to cope with their more fortunate competitors, some Rileyville farmers absorbed the poorer and smaller units of their neighbors and spent much time and money in removing boulders so that machinery could be used. Enlarging the size of individual fields was also attempted, though it involved the removal of many tons of stone hedge. One farmer even tried to construct a stone rake to remove the small stones that appeared at each plowing.

The Rileyville farms produced fruit, berries, potatoes, chickens, eggs, butter, and grain. The general store accepted small lots in trade and sold them ungraded to consumers who were satisfied because nothing better was available. Large-scale western production brought sprayed, graded, and uniform-quality produce to eastern markets. If the local farms had been large enough to justify the expense of "new-fangled" sprays and other equipment, the soil and climate would have produced inferior products, even with the best management. Although there were an ever increasing number of urban consumers right at its door, Rileyville lost its market to far distant producers who supplied a better product, often at lower prices.

While this decline was in progress, increasing urban opportunities were close at hand, offering the younger generation a higher standard of living. Consequently, the young people left the farms at a time when their elders most needed additional labor to compete with outside production. By 1900 the smaller, poorer farms were already merged with neighboring ones and the enlarged units struggled along for a few years. The owners, realizing the futility of the struggle, or reaching old age without a son to succeed them, sold their farms at the best price obtainable.

The best market for this property was New York City, where immigrants reared on farms across the water had amassed small sums and were anxious to return to the quiet security of a rural environment. Their European experience made these marginal farms attractive, and they often paid prices far in excess of a reasonable appraisal. Confident in their knowledge and uninformed of the failing productivity of the land and the fallacy of European comparisons, they seldom sought advice before embarking on the new venture.

The first buyers of farms in Rileyville were Germans, and friends and countrymen followed them. A new series of names appeared: Meyer, Boch, Mohl, Raible, and Egger, so that the place was nicknamed "Sauerkraut Mountain" by those in the valley villages. Most of these new farmers entered the community during the first decade of the present century. They were accustomed to hard work, long hours, and a lower standard of living, which with their urban-acquired savings, made it possible to subsist on the marginal farmland for a few years.

However, income soon fell below even their expectations. Some of them sold their farms at a sacrifice to other immigrants, chiefly from southwestern Europe, who were accustomed to a still lower standard of living. New names appeared—Carniglia, Rafelowski, Terrante, and Semonovigo. These, a few Germans, and

one Dutchman of the original stock still live on the farms, obtaining their support from children living in the city or by commuting daily or weekly to work in urban communities as far away as New York. Today, not a single farm in Rileyville is being operated.

This does not mean that the Rileyville area eventually will be depopulated. The greatest decrease in population took place from 1895 to 1905, during the period of farm mergers. At that time farmsteads were vacated and torn down. Those remaining continued as homes after farming was abandoned. With the advent of good roads and cheap automobiles, all standing farmsteads have gradually been reoccupied and a few new houses built for commuters.

These changes in population and land utilization were accompanied by other important developments. The establishment of R.F.D. routes made it unnecessary to visit the general store for mail; it was now possible to purchase supplies from mail-order houses without meeting the scornful gaze of the proprietor. Thus, began the decline of the Rileyville store, and more serious for the community, the frequency of contact between neighbors was reduced.

Rural mail delivery and the automobile demanded better roads. Here and there dirt roads were given a thin covering of loose, crushed stone, so that by about 1912 the mail carrier deemed them sufficiently improved to justify the use of a car; from that time on deliveries became more certain and a route could be covered in less than half the time required by horse and wagon. Road improvement, even before the farmers acquired cars, increased the frequency of weekly trips to the villages for supplies. By 1910, most of the farmers had ceased to buy regularly at the store, except when an unexpected shortage developed.

As the volume of trade at the general store fell off, the variety, quality, and freshness of its goods declined, making the inhabitants more and more reluctant to buy at home. The storekeeper, in a futile effort to hold his trade, did not increase his prices as the volume of sales dropped, but decreased his standard of living. However, as income had reached the vanishing point, the store finally closed in 1913, and the building burned down soon thereafter. The history of its ownership was similar to that of the surrounding farms: the original Yankee with decreasing profits sold to a German merchant who lost his investment a few years later.

With the passing of the store, Rileyville became just a name. With good roads and cars, the inhabitants can reach their source of supply as quickly as they could in 1900, even though three or four times as far, and can purchase better merchandise. Although the elimination of the general store did not affect the economic life of the community, its closing was an important factor in reducing its solidarity. The almost daily visits bound the inhabitants together with ties of friendship and mutual understanding. Had it remained, many newcomers might have been assimilated.

The second important institution—the school—continued to function until 1916, when three factors led to its abandonment. The road to Hopewell received

a covering of crushed stone, reducing both time and cost of travel in all seasons; the abandonment of farmsteads and newcomers without children of school age, reduced enrollments year by year; improved facilities in the Hopewell school made greater demands on Rileyville; and the newer settlers were accustomed to the educational opportunities of the cities. Only one effort at improvement was made; in 1912 a cloakroom was added so that wet overshoes, coats, hats, and dinner pails were not hung along the walls of the classroom. However, it was not heated and so the schoolroom, save during the warmer months, still served for lunch and play.

While transportation by bus still throws the children together for short periods daily, it does not result in the same intimate relationship, and the parents do not hear as much about the doings of their neighbors from the prattle of the children over the supper table. Of course, with the closing of the old Tidd's School, entertainments and other local social activities ceased. School functions are now Hopewell affairs; the Sourland Mountain children have lost their identity; they are merely a portion of the rural enrollment that comes to Hopewell from all sides.

So again, Rileyville suffered by the closing of one of its institutions. The transferal of the children to the village school unquestionably gave them better educational facilities and a larger outlook on life, but, at the same time, it hastened the complete disintegration of their community. The spacious, tree-shaded grounds surrounding the old school were sold and the building remodeled as a residence.

How did the Mountain Christian Church fare? In true Christian spirit, it invited the newcomers to attend its services. The invitation was not generally accepted—not so much because of antagonism as of indifference and a sense of not belonging. Too, some newcomers were not punctilious in their obligations; Sabbath labor seemed righteous when starvation and failure stared them in the face. It is true that in a few instances embarrassment and resentment were factors—the “city slicker” having been sold a gold brick by the “rube.” Newcomers who did attend were given no voice, control and offices being retained by the old families. Lastly, quick and comfortable autos made the larger, village churches available.

For years the church continued to hold services in the face of ever-decreasing attendance. Then, for a time, it was closed. Now, the one remaining Dutch family holds occasional services during the summer months, but the church has long since ceased to be a community force. Attendance is often out of love of novelty.

With the introduction of the automobile and tractor, and the abandonment of farming, the need for a blacksmith passed. When the old smith died, no one took his place. The little blacksmithing now necessary is done in Hopewell. Thus, the fourth institution that helped hold Rileyville together is gone. The distillery and cider and vinegar works closed as the community disintegrated.

Another tie that gave way to “progress” was the time-honored custom of

"working on the road." Every spring and at times in the fall, farmers were hired by the local road commissioner who was himself a farmer. The work consisted largely of digging the dirt out of the ditches and putting it back in the ruts. These were festive occasions from which the biggest return was not the dollars earned, but the friendships and comradeship developed among the men of the community. Crushed stone, scrapers, and other road machinery created a specialized road worker, and farmers no longer spent friendly hours exchanging stories while shoveling dirt.

With every economic and social tie weakened or removed, small wonder that Rileyville is now a geographical location unknown to those who speed over its roads. Its inhabitants come from all strata of society—the very poor who find a ramshackle farmstead the cheapest place to live; the commuter who endures the discomforts of traveling for the peaceful wilderness surroundings of the Mountain; the retired farmer who did not follow his fellows into the villages; and the wealthy who find seclusion and large acreages at low prices. These people have no racial tie or common economic or social interest. Their affairs take them elsewhere and they travel long distances to associate with "neighbors" with whom they have a common social or business interest. There is hardly a single reason for them to work with abutting property holders.

So today Sourland Mountain is the home of strangers. Roads are arranged to permit rapid transit to the villages, where once they served a community engaged in farming. As a result some that had been in use for over a hundred years have been closed and are today impassable. The Mountain that supported many families, now furnishes a livelihood for no one. A possible exception are the proprietors of "Hill Billy Tavern," a beer emporium drawing its trade largely from the valley. Fields that once furnished food are covered with weeds and slowly being engulfed by the surrounding forest. The land serves no useful purpose except for recreation and an occasional home site. Here is an area that is growing wilder within an hour's journey of the teeming metropolises of New York and Philadelphia. Twenty years ago only small animals were seen, but now deer and foxes are probably more plentiful than in Indian days.

What of the future? Will this Mountain ever again add to the material wealth of the Nation? Will it provide the wherewithal to feed, clothe, and shelter American families? Finally, will it regain its community status, providing not only homes but also a desire to work for the betterment of the area and the group.

It does not seem likely that farming will ever be a major land use in this area. The material wealth will be in the form of game, fur, cellulose, and other forest products. Ruthless cutting of second-growth timber, so common elsewhere in the United States, may not take place because of the area's possibilities for residential and recreational purposes. While Sourland Mountain will never again produce a livelihood for so many families, the forest and the needs of the residents will provide a certain amount of employment. Most of the home owners will continue to earn their livelihood elsewhere, living on the Mountain because of

the peaceful hinterland. Their wants will be largely supplied by the valley villages; there may never be a demand for a local store; nor will the parents send children to a one-room school. For many years, the people will not become a close-knit social group, although differences in background and interest may fade and incomes and economic status become less divergent. With these changes and the decline in sectarianism, a local church may command moderate interest and attendance. So it would appear that in years to come the inhabitants of Rileyville will again have a small measure of community interest, but Rileyville as it once was has probably lost its identity to the larger Hopewell community forever.

THE POET AND THE PLOUGH

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A recent article entitled "Turnips and Romanticism" has made clear the extent to which eighteenth-century literary men were engaged in popularizing the agrarian life in England and elsewhere.¹ Since it was subsidiary to his thesis, the author devoted little space to that interesting phenomenon of the century, the extended didactic poem, which, as one of its proponents explained, by "The harmony of numbers engages many to read and retain what they would neglect, if written in prose."² These poems were essentially rhymed textbooks designed to give instruction in deep and difficult subjects in pleasant and memorable form. Thus Samuel Johnson commended John Philips' *Cyder* (1708) because

... it is grounded in truth; . . . the precepts which it contains are exact and just; . . . it is therefore, at once, a book of entertainment and of science. This I was told by Miller, the great gardener and botanist, whose expression was, that "there were many books on the same subject in prose, which do not contain so much truth as that poem."³

The poets roamed from Saturn's satellites to the bowels of the earth, hailing the achievements of science and the mysterious workings of God, and elucidating them to the layman. Agriculture, which was on the way toward becoming a science, was, of course, not excluded from their pages. *Cyder* was the first important agricultural poem of the period.⁴ Others which deserve notice are: Christopher Smart's *The Hop Garden* (1752);⁵ Robert Dodsley's *Agriculture*

¹ Paul H. Johnston, "Turnips and Romanticism," *Agricultural History*, 12:224-255 (July 1938).

² Richard Blackmore, preface to *Creation*.

³ Alexander Chalmers, ed., *The Works of the English Poets*, 8:370 (London, 1810). The botanist referred to is Philip Miller (1691-1771), foreman of the Chelsea Garden, author of the well-known *Gardener's and Florist's Dictionary* (1724), and England's foremost gardener during his life. His dictionary, incidentally, quotes from Philips' poem in regard to varieties of apples used for cider.

⁴ See *The Poems of John Philips*, ed. by M. G. Lloyd Thomas (Oxford, 1927), for notes showing analogies between Philips' poem and such source books as John Beale, *Herefordshire Orchards, A Pattern for England* (London, 1657); "Aphorisms concerning Cider" in John Evelyn, *Pomona, or an Appendix concerning Fruit-trees, in relation to Cyder* (London, 1664), which was added to his *Sylva*; John Worlidge, *Vinetum Britannicum: or a Treatise of Cider* (1678); etc.

⁵ Of this an early editor wrote disparagingly: "On the *Hop Garden* much commendation cannot justly be conferred; and the praise which is withheld from the poetry will not be very cheerfully lavished on the instructions. The Author seems to have addressed himself to the task without previous information on the art of which he treats."—*The Poems of the late Christopher Smart*, xxxiv-xxxv (London, 1791).

(1753); John Dyer's *The Fleece* (1757); James Grainger's *The Sugar-Cane* (1764); John Scott's *Amoebean Eclogues* (1783?); William Cowper's *The Task*, Book 3 (1785);⁶ and Erasmus Darwin's *The Botanic Garden* (1791).

How valuable the gentleman farmer, who at the same time read poetry and prided himself on his farm, found these rhymed treatises is a moot question. There is something faintly ridiculous in visualizing such a man reading passages from Dyer's *The Fleece* to his hired hands at sheep-shearing time. However, even the best of the prose works on agriculture were either so abstruse or so shot through with error that intelligent men would turn from them in dismay. As late as 1775, James Anderson, disgusted with available books, saw a compelling need to write one of his own.⁷ This situation has been explained as follows:

Full as the time was of promise for European agriculture, when practical men resorted to science for information and scientific men turned toward nature for an object of research, it was fraught, too, with danger; for the husbandman ran no small risk of becoming so disgusted with the fallacies and mistakes of science, as to be induced to repel in future all overtures of help from so suspicious a quarter.⁸

At all events, an analysis of a typical poem of the genre, Dodsley's *Agriculture*, will serve to show what the didactic poets sought to do, and, of more especial interest, will indicate what seemed significant in agricultural theory and practice to an alert dilettante writing rather from book than from experience but certainly not unaware of the good earth surrounding London.

The first canto of Dodsley's poem is of no especial interest to the practical farmer; here the poet presided over the husbandman, and the space is devoted to the traditional statement of theme, address to a noble person, invocation, and so forth. An unwitting irony occurs when, after depicting the farmer as "happiest of mortal men" and as one who "plants his foot/ With firmness on his old paternal fields/ And stands unshaken,"⁹ he invoked the sons of wealth to turn to the pleasant arts of cultivation, a movement which took form in the enclosures and assisted toward the impoverishment and virtual wiping out of the English yeoman class. It must have seemed to Dodsley as it did to Arthur Young that, if scientific methods were brought to bear upon the land, the yeoman farmer, already relatively well-off, would profit still more. Sadly, this effect did not take place. As the agricultural revolution progressed, as the rich turned to

⁶ His powers, Cowper said:

Pant for the praise of dressing to the taste
Of critic appetite, no sordid fare,
A cucumber, while costly yet and rare.

⁷ James Anderson, *Essays Relating to Agriculture and Rural Affairs* (Edinburgh, 1775).

⁸ Russell M. Garnier, *History of the English Landed Interest*, 293 (London, 1893). Richard Bradley, professor of botany at Cambridge, for example, wrote learnedly that plants derived all their food from air. Jethro Tull wrote in opposition to Bradley but advanced the equally mistaken idea that fertilizers were less good than harm.

⁹ Chalmers, *Works of the English Poets*, 15:353.

farming, the yeoman farmer's condition grew steadily worse. As a student of the eighteenth century has recently said:

Throughout the eighteenth century the political economist condemned the common field system as wasteful, extravagant and hopelessly uneconomic, and yet under that system the peasant was well fed, contented and prosperous; agricultural wages were higher than they had ever been since the reign of Henry VI, commodities were cheap, and a large export trade in grain was carried on with the Continent. At the close of the century, the agricultural labourer was earning a wretched pittance and was half supported by the rates, while food was nearly twice as dear.¹⁰

Of purely academic interest, too, is Dodsley's adoption of Dr. Boerhaave's theory of the cause of fecundity,¹¹ and his use of Stephen Hales' *Vegetable Staticks* (1727) as a basis for the hymn to God which closes the canto.¹² In the second canto, however, he got down to cases. Different soils and their culture engaged his attention first. Sandy soil, he explained, too easily admits both sun and rain; plants, as a result, are too quickly pushed into life and too quickly decay. To correct "this error of the ardent soil," he recommended the application of cool manure and clay. Too-clayey soil also has in kind its disadvantages, but it will yield to cultivation. The farmer is adjured to "give the plough no rest," apply warm dungs, and add sand to the close-cohering mass. Dodsley proceeded next to versify passages from Jethro Tull's epochal *Horse-Hoeing Husbandry*.

¹⁰ Rosamond Bayne-Powell, *English Country Life in the Eighteenth Century*, 10 (London, 1935). Their sad case was blamed by more fortunate Englishmen upon drunkenness, laziness, and prodigality. As Arthur Young noted with some spirit, these were effects rather than causes: "Go to an alehouse kitchen of an old enclosed country, and there you will see the origin of poverty and poor rates. For whom are they to be sober? For whom are they to save? (Such are their questions) For the parish? If I am diligent, shall I have leave to build a cottage? If I am sober, shall I have land for a cow? If I am frugal, shall I have half an acre of potatoes? You offer no motives; you have nothing but a parish officer and a workhouse!—Bring me another pot!"—*Annals of Agriculture*, 36:508 (1801).

¹¹ Dodsley's footnote to the passage reads: "According to Dr. Boerhaave and other modern philosophers, all the motion in nature arises from fire; and taking that away all things would become fixt and immovable: fluids would become solid; a man would harden into a statue; and the very air would cohere into a firm and rigid mass."—Chalmers, *Works of the English Poets*, 15:354.

¹² The hymn begins as follows:

Her [earth's] latent salts, sulphureous oils,
And air, and water mixt; attract, repel,
And raise prolific ferment.

—Chalmers, *Works of the English Poets*, 15:354.

This paraphrases the long sentence in Stephen Hales, *Statical Essays* (London, 1738): "We find by the chymical Analysis of Vegetables, that their substance is composed of sulphur, volatile salt, water and earth; which principles are all endued with mutually attracting powers, and also of a large portion of air, which has a wonderful property of strongly attracting in a fixt state, or of repelling in an elastick state, with a power which is superior to vast compressing forces; and it is by the infinite combinations, action and reaction of these principles, that all the operations in animal and vegetable bodies are effected."—p. 319-20.

The pasture, and the food of plants,
 First let the young agriculturist be taught:
 Then how to sow, and raise the embryo seeds
 Of every different species. Nitre, fire,
 Air, water, earth, their various powers combine
 In vegetation; but the genuine food
 Of every plant is earth! . . .
 Is earth the food of plants? Their pasture then
 Is earth's inverted surface. This the swain,
 By ceaseless tillage, or the use of dung,
 Must or ferment, or pulverize, to fit
 For due reception of the fibrous roots:
 But from the streams of ordure, from the stench
 Of putrefaction, from stercoraceous fumes
 Of rottenness and filth, can sweetness spring?¹³

Carrying on with Tull's doctrines, Dodsley suggested use of the plough, hoe, harrow, and roller to fructify the soil, and launched next into a dissertation on Tull's method of sowing seed:

Thus taught the Shalborne swain; who first with skill
 Led through the fields the many-coulter'd plough;
 Who first his seed committed to the ground.
 Shed from the drill by slow revolving wheels,
 In just proportion and in even rows;
 Leaving 'twixt each a spacious interval,
 To introduce with ease, while yet the grain
 Expanding crown'd the intermediate ridge,
 His new machine, form'd to exterminate
 The weedy race. . . .
 . . . to pulverize the soil,
 Enlarge and change the pasture of the roots,
 And to its last perfection raise the crop.¹⁴

So Dodsley allied himself with a method which had been too startling an innovation to find many immediate adherents.¹⁵ For the debit side of Tull's ledger, he noted that he "practis'd ill the lore/ Of his own precepts," and,

¹³ Canto 2. Jethro Tull, in *The Horse-Hoeing Husbandry* (London, 1829), wrote: "It is agreed that all the following materials contribute in some manner to the increase of plants, but it is disputed which of them is that very increase or food. 1. Nitre. 2. Water. 3. Air. 4. Fire. 5. Earth."—p. 46.

"And earth is so surely the food of all plants, that with the proper share of the other elements, which each species of plants requires, I do not find but that any common earth will nourish any plant."—p. 52.

Tull's answer to the question concluding the quotation is well-known: "there is . . . reason to prohibit the use of dung in the kitchen-garden, on account of the ill taste it gives to esculent roots and plants, especially such dung as is made in great towns."—p. 69. He objected, too, to the fact that manure-laden fields bore flourishing crops of weeds.

¹⁴ Chalmers, *Works of the English Poets*, 15:355-356.

¹⁵ "Of course, like all improvers, he was met with unlimited opposition, and on the publication of his book he was assailed with abuse, which, being a sensitive man, caused him extreme annoyance."—W. H. R. Curtler, *A Short History of English Agriculture*, 178 (Oxford, 1909).

hinting that sloth may have been the reason, composed a disquisition on the bad effects of that deadly sin. With the dairy farms near London in mind,¹⁶ he disagreed with Tull's opinions respecting "the dunghill's aid" and wrote a passage which to readers accustomed to Longfellow and Tennyson must seem strange poetry indeed:

Let oily marle appoint
Its unctuous moisture, or the crumbling tan
Its glowing heat. Nor from the gazing herds,
Nor bristly swine obscene, disdain to heap
Their cooling ordure. Nor the warmer dungs
Of fiery pigeons, of the stabled horse,
Or folded flock, neglect. . . .¹⁷

But, he said, if none of these—or of others which he mentioned—will avail,

Then, farmer, raise immediate from their seeds,
The juicy stalks of largely-spreading pulse,
Beans, buck-wheat, spurry, or the climbing vetch;
These early reapt, and bury'd in the soil,
Enrich the parent womb from whence they sprung.
Or sow the bulbous turnip; this shall yield
Sweet pasture to the flocks or lowing herds,
And well prepare thy land for future crops.¹⁸

Dodsley's next consideration is hedging and ditching; in rather minute detail he explained how best to plant and defend from depredation a hawthorn hedge.¹⁹ From this he moved to the planting of forest trees, then on to drainage and flooding, and ended the canto with a eulogy of landscape architecture, an art in the greatest repute in England at that time.²⁰

¹⁶ These farms seem to have achieved notable fame. Garnier, *History of the English Landed Interest*, 257-258, commented: "In the home counties, and especially around London, the practise of dairy farming . . . had been brought almost to the perfection it has attained at the present day. . . . Kalm, in 1748, noticed, even as early as the first of May, a grass growth so thick and luxuriant that it was a foot and more in height. . . . He learned that the secret of their success was the practise of manuring each enclosure heavily with well-rotted town manure every autumn, and moss-harrowing it each spring with sloe twigs attached to handles and drawn by horses."

¹⁷ Chalmers, *Works of the English Poets*, 15:356. Grainger, in his *Sugar Cane*, feared for his Muse when he launched into the same subject. He wrote apologetically:

Of composts shall the Muse descend to sing,
Nor soil her heavenly plumes?

¹⁸ Chalmers, *Works of the English Poets*, 15:356.

¹⁹ . . . to defend

Thy infant shoots from depredation deep,
At proper distance drive stiff oaken stakes;
Which interwove with boughs and flexile twigs,
Frustrate the nibbling flock, or browsing herd.

—Chalmers, *Works of the English Poets*, 15:356.

²⁰ Cf. Arthur O. Lovejoy, "The First Gothic Revival and the Return to Nature," *Modern Language Notes*, 47:419-46 (November 1932), for a discussion of the relation of landscaping to Romanticism.

The third canto opens with a traditional pastoral treatment of haymaking, but soon lapses into the more pedestrian expository manner to elucidate a method of preserving hay from being mowburnt or taking fire:

Ah, with care
Accumulate thy load, or in the mow,
Or on the rising rick. The smother'd damp,
Fermenting, glow within; and latent sparks
At length engender'd, kindle by degrees,
Till, wide and wider spreading, they admit
The fatal blast, which instantly consumes,
In flames resistless, thy collected store.
This dire disaster to avoid, prepare
A hollow basket, or the concave round
Of some capacious vessel; to its sides
Affix a triple cord: then let the swains,
Full in the centre of thy purpos'd heap,
Place the obtrusive barrier; rising still
As they advance, by its united bands,
The wide machine. Thus leaving in the midst
An empty space, the cooling air draws in,
And from the flame, or from offensive taints
Pernicious to thy cattle, saves their food.²¹

After this explicit prosiness, Dodsley was moved by a more exalted theme—"the praise of England with regard to its various products"—and then made a quick transition to the care of sheep, cattle, and horses. For mangy sheep he prescribed tobacco "in the briny wave infus'd," for vermin, "dust of deaden'd lime;" from these minor ailments he leaped to the worst:

Diseases numerous
Assault the harmless race; but chief the fiend
Which taints with rottenness their inward frame, . . .
This, this demands
His watchful care. If he perceives the fleece .
In patches lost; if the dejected eye
Looks pale and languid; if the rosy gums
Change to a yellow foulness; and the breath,
Panting and short, emits a sickly stench;
Warn'd by the fatal symptoms, he removes
To rising grounds and dry, the tainted flock, . . .
But if bare and barren hills,
Or dry and sandy plains, too far remov'd,
Deny their aid, he speedily prepares
Rue's bitter juice, with brine and brimstone mixt,
A powerful remedy; which from an horn
Injected, stops the dangerous malady.²²

²¹ Chalmers, *Works of the English Poets*, 15:359.

²² *Ibid.*, 361. A favorite remedy of the time. "Bruise a quantity of rue-leaves well, and press out the juice to which add an equal amount of salt." *Gentleman's Magazine*, 33:593. "Put a handful of rue into a pail of water, and in the morning add as much salt as will make it bear an egg. . . ."—*Ibid.*, 36:546.

What Dodsley knew of Robert Bakewell's important contributions to scientific breeding is not made clear. He recognized, as few sheepmen of the time apparently did, the necessity for careful breeding, however, and recommended the following sire:

His body large and deep, his buttocks broad
Give indication of internal strength:
Be short his legs, yet active; small his head;
So shall Lucina's pains less pungent prove,
And less the hazard of the teeming ewe:
Long be his tail, and large his wool-grown ear;
Thick, shining, white, his fleece; his hazel eye
Large, bold, and chearful; and his horns, if horns
You choose, not straight, but curving round and round
On either side his head.²³

Whatever ram this describes, it is a far cry from the pre-Bakewell archetype—"His frame large, and remarkably loose. His bones, throughout, heavy. His legs long and thick, terminating in large splaw feet. His chine, as well as his rump, as sharp as a hatchet. His skin might be said to rattle on his ribs. . . like a skeleton wrapped in parchment."²⁴ And from the phrase "if horn you choose," one may infer that Dodsley was not a party to the superstitions of contemporary breeders.

If any care was shown in the selection of rams and ewes, the choice was guided by fanciful points which possessed no practical value. Thus Wiltshire breeders demanded a horn which fell back so as to form a semi-circle, beyond which the ear projected; Norfolk flockmasters valued the length and spiral form of the horn and the blackness of the face and legs; Dorsetshire shepherds staked everything on the horn projecting in front of the ear; champions of the South Downs condemned all alike, and made their grand objects a speckled face and leg and no horn at all.²⁵

Dodsley's eye here was rather more strictly on essentials than the eyes of "practical" farmers. One might hazard the idea that the flockmaster reading Dodsley's *Agriculture* to his men is a less ludicrous picture than on first thought it seemed. This is, of course, a very bad poem—as a poem—and it died an early and unlamented death. Only for the historian does it have its points of interest. But they are such, I think, that the writer whose field of study is the eighteenth-century agrarian movement in England may well be motivated to consult not only the prose writers of the time but the poets as well, who, so to speak, called down their muses from the intense inane and hitched them to the plough.

²³ Chalmers, *Works of the English Poets*, 362.

²⁴ Quoted in Baron Ernle (Rowland E. Prothero), *English Farming, Past and Present*, 186 (ed. 5, London, 1936), from William Marshall, *The Rural Economy of the Midland Counties*, 1:335 (ed. 2, London, 1796).

²⁵ Ernle, *English Farming, Past and Present*, 179.

THE WESTERN FARMERS AND THE DRIVEWELL PATENT CONTROVERSY

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After the Civil War the western farmers were confronted with several important problems.¹ In addition to falling prices and rising costs, they had a long and bitter controversy with the railroads. In many ways as important was their struggle against what they called the "outrages of the patent rights system." From the earliest days western farmers had no affection for "patent right" articles, and they continually complained about the evils of the system. Patents, in their view, were issued on articles and principles long in common use and in no sense on inventions, while extensions or reissues in the form of so-called improvements were often obtained through political influence. The purchaser or user was held legally responsible for damages or royalty if an article infringed upon the rights of patentees.²

Farmers, especially in the Middle West, experienced no end of trouble. Deluged with circulars from manufacturers and patentees, they were threatened and harassed by royalty collectors on such articles as sliding gates, milk cans, barbed wire, clover hullers, plows, sewing machines, grain binders, and drive-wells.³ In purchasing one of these commodities they were seldom certain that it was properly patented, and when two or more patents had been granted on the same article they did not know which was void and which valid. One western writer summarized the situation when he wrote: "How is a farmer to know to whom to pay the royalty, even if it was legal, with three or four applicants swarming around him, all claiming to be the legal patentees, as in the case with both the drive well and barbed wire."⁴ In a number of instances a person was sued upon something that he had developed himself or had seen in use among his friends and neighbors before any patent had been granted.⁵ Such anxiety arose

¹ The material used in this article was obtained in connection with a larger investigation which was made possible by a Social Science Research Council grant-in-aid.

² Solon Justus Buck, *The Granger Movement*, 118-119 (Cambridge, 1913).

³ *Iowa State Register* (Des Moines), Mar. 19, 26, 1879, Mar. 30, June 9, Aug. 4, 1881; *Keokuk Gate City* (Iowa), Jan. 5, 1882; *Western Rural and American Stockman* (Chicago), 22:604 (Sept. 20, 1884); *Sycamore True Republican* (Ill.), Dec. 22, 1880.

⁴ *National Live-Stock Journal* (w. ed., Chicago), 3:435 (July 12, 1887). A far-western editor stated that the country "is so large and the number of articles under patent so great that there are not one-tenth of our farmers who know whether their implements are patented or not . . . and living away in the interior of the country . . . without the abundant facilities for posting himself . . . it is a very difficult thing . . . for the farmer to be posted as to who is the proper owner of the right to manufacture and sell various articles he now finds in the market."—*Rocky Mountain Husbandman* (White Sulphur Springs, Mont.), June 8, 1882.

⁵ *Western Rural*, 26:181 (Mar. 24, 1888).

among the farmers that general protest was heard against the entire patent system.

Symptoms first appeared in the Middle West. Newspapers, Granges, Alliances, and agricultural societies were quite active in denunciation. In 1878, the master of the Michigan State Grange, stated in his annual address that "The recent swindles attempted to be perpetrated on the farmers of our State, by patent right tramps who claim royalty on the common sliding gate, in common use on almost every farm in the State, and the recent decision of the Minnesota Court, favoring the 'drive-well' swindle, makes it necessary that we should again press this matter before Congress, and request that action be taken without delay."⁶ In 1880, the Iowa State Agricultural Society, representing discontented elements, forwarded a resolution to Congress stating that "the outrages perpetrated by the aid of patent right laws or by their abuses are crying aloud for relief; and that we request our members of Congress to so amend them as to remedy the evils or, if this cannot be done, that their evils being so much superior to their benefits, that they should be totally abolished."⁷ The *Western Rural*, voicing the opinions of many of the western Alliances, carried numerous denunciations, one of which stated that the "patent office needs a thorough purification, and a good deal more industry and practically inclined brains than it has had."⁸

As early as 1877, efforts were made in Congress to reform the patent laws, bills being introduced in rapid succession.⁹ Among many speeches in support of these bills was one by Senator Samuel G. Kirkwood of Iowa. In a lengthy discussion he pointed out:

If Senators understood, as those living where the Senator from Minnesota [William Windom] and I live understand, the effect of the existing [patent] law, it seems to me they would be diligent to help us in some way to some remedy. Take the so-called barb wire being extensively used now in the State where I live for fences. . . . They [farmers] cannot know whether one man's patent is good or another man's patent is good. . . . They must either buy the wire and fence their fields, or leave them unfenced . . . [Someday] a patentee shall come along and say to each, "Sir, pay me so much a mile or so much a rod for the wire . . . or you must go to Des Moines . . . and defend a suit to be brought against you, the cost of which and the fees in which will in themselves be more than I demand of you." The thing [that] is being done in . . . Iowa now in regard to these barb wire fences, is being done . . . in regard to what is called drivewell[s], and our people are paying day by day \$10, \$15, \$20, when they do not know a particle more whether they owe the man a dollar or a cent . . . but paying the money just because it is cheaper to do it than to defend a suit. . . . Should they not have some protection?¹⁰

⁶ J. J. Woodman, in Michigan State Grange, *Proceedings* (1878), 6:11.

⁷ *Iowa State Register*, Jan. 13, Feb. 9, 23, Mar. 2, 1881; *Keokuk Gate City*, Feb. 23, Nov. 30, 1880, June 30, 1881.

⁸ *Western Rural*, 19:225 (July 16, 1881). Cf. *Janesville Daily Recorder* (Wis.), Dec. 19, 1880.

⁹ "Arguments before the Committee on Patents of the Senate and House of Representatives", 45 Congress, 2 Session (1877-78), *Senate Miscellaneous Document 50*.

¹⁰ *Iowa State Register*, Jan. 7, 21, Feb. 4, 1879.

The bill referred to by Senator Kirkwood passed the House of Representatives only to expire in the Senate, as did most of them—but others kept coming.¹¹ In 1882, a bill was presented in the House which provided that no action could be taken against the user of a patented article if it had been purchased for a valuable consideration in the open market; another, in 1883, stipulated that the innocent purchaser or user was to be protected, and that the manufacturer and vendor were to be held liable. A year later, a representative from Kansas introduced a bill “to limit the life of patents to five years,” and in 1886 a member from Illinois tried to limit the jurisdiction of Federal courts to cases wherein damages exceeded \$200.¹²

These bills were obviously attempts to protect the small farmer. Congress afforded him little relief, however, and he resorted to collective action in the courts to free himself from the “injustices” of the patent system. Mutual protective societies were organized to raise funds, employ counsel, and fight cases through the Federal courts. In some of the patent cases local Granges and Alliances assisted.¹³ The controversy between the farmers and the drivewell patentees is the subject of this essay. It was waged simultaneously with the similar struggle against the barbed-wire patentees, and, continuing for nearly a decade, it ended favorably in the United States Supreme Court.¹⁴ The patent involved was hotly contested, and probably provoked more discontent than any other except the one covering barbed wire.

The drivewell invention was a product of the Civil War period. In 1861, Nelson W. Green, a young man with some West Point training, organized a volunteer regiment in his home community of Cortland, New York, and was placed in command as colonel. While encamped on the fair grounds at Cortland, Green instructed one of his lieutenants, Byron Mudge, to install a device for

¹¹ Buck, *Granger Movement*, 119.

¹² *Industrial World and Iron Worker* (Chicago), June 1, 1882, Feb. 7, 14, 1884, Apr. 5, 1886, Jan. 5, 1887; *Chicago Times*, Mar. 20, 1884; *Iowa State Register*, Jan. 5, 1887; *Midland Industrial Gazette* (St. Louis), Feb. 7, 1884; *Scientific American* (n.s.), 58:37 (Jan. 21, 1888). In 1886, there were seven bills before Congress to amend the patent laws.—*Western Manufacturer* (Chicago), 14:94 (May 31, 1886). The attack on the patent system became so widespread that leading inventors came to its rescue. Several of them felt that these granger proposals “was legislation that would favor the corporations,” and consequently they opposed them. See Clark Alvord to B. F. Butler, Baltimore, Feb. 7, 1879, and Thomas A. Edison to Butler, Menlo Park, N. J., Feb. 17, 1879, in the Butler Papers, Manuscript Division, Library of Congress. In 1884, a National Inventor's Mutual Protective Association was organized. See *Midland Industrial Gazette*, Feb. 21, 1884; *Western Manufacturer*, 12:194 (Oct. 31, 1884); *Industrial World and Iron Worker*, Mar. 27, May 15, July 17, Oct. 30, 1884.

¹³ *Iowa State Register*, Mar. 30, 1881; *Western Rural*, 20:4 (Jan. 7, 1882); *American Agriculturist*, 42:221 (May 1883). In 1878 the farmers of Michigan organized the Farmer's Mutual Defence Association to fight the Teal patented sliding gate. A fee of \$2 was collected from each member, and the case was finally won in 1880. See the Michigan State Grange, *Proceedings* (1878) 6:11–14, 61; (1879) 7:12–13, 40–41; (1880) 8:15, 52.

¹⁴ For the controversy between the farmers and the barbed-wire patentees in Iowa, see Earl W. Hayter, “An Iowa Farmers' Protective Association,” *Iowa Journal of History and Politics*, 37:331–362 (October 1939).

securing water, which Green had conceived on hearing that "the rebels were intending to poison the wells in places where the Union armies might come."¹⁵ The device was a 1½ inch galvanized pipe, pierced, painted with zinc, and having a point on one end covered with a wire strainer. It was driven into the ground by means of a wooden block and sledge hammer until the point projected into the water sands, and a small pump was then attached at the surface. Its success depended upon a vacuum, formed by the pump and the tight connection between the earth and the driven pipe, which eliminated the atmospheric pressure.

Shortly after the sinking of the drivewell device, Green became involved in trouble with his regiment because of his strict discipline, and as a result he shot and wounded a captain. This gave rise to intense excitement in and around Cortland, and it was rumored that there would be an attack upon the camp. Thirty regimental officers applied to the general for a hearing on charges that Green "had shown by his conduct that his mind was affected, and they did not wish to go into battle with him."¹⁶ Relieved of his command, he was tried by a military court and reinstated. Later, he was again suspended, and after April 1862 his connections with the regiment ended. Following this disappointment his real troubles began.

Complications arising out of the shooting affair helped to undo Green. Despondency overtook him to such an extent that he was accused by his neighbors of being insane; he was harassed by civil suits because of his debts; and, finally, difficulties arose between him and his pastor in Cortland. He was a devout member of the Grace Episcopal Church, and when he organized his regiment the pastor opposed him on the ground that it was not a "peaceable act." Green was ultimately dismissed from the congregation and as a result brought a libel suit against the pastor which was drawn out for a considerable time.¹⁷ All of these "unusual" and "extraordinary circumstances" served as legal grounds for Green's delay in applying for a patent on his drivewell device.¹⁸

While these "unusual circumstances" were occupying Green, other men were busy taking out patents on the drivewell. Mudge, who had driven the first well at the fairground, constructed two or three more in the village of Cortland with the assistance of a well digger named James Suggett. After the regiment had gone off to war, Suggett applied for a patent on a pump to operate the wells and secured it early in 1864. Mudge, after being relieved of army duties in the fall of 1865, applied for a patent on the process of sinking the well, and it likewise was granted.¹⁹ On hearing of these patents, Green also applied in the spring of 1866, although over four years had passed since he had made his invention

¹⁵ 123 *United States Supreme Court, Records and Briefs*, 1:298-299, 300-301; 1 *Federal Cases*, 875; N. W. Green, *The American Driven Well*, 4 (Seneca Falls, N. Y., 1869).

¹⁶ 123 *U.S.S.C., Records and Briefs*, 1:329, 331, 339; 16 *Federal Reporter*, 392.

¹⁷ 123 *U.S.S.C., Records and Briefs*, 1:339-340, 354 ff.

¹⁸ 1 *Federal Cases*, 876.

¹⁹ 103 *United States Reports*, 660; Cowing & Company, *The American Driven Well*, 8-9 (New York, 1868).

public. The Patent Office, after some deliberation, declared that an interference existed between the three parties. The case was brought before the Primary Examiners who decided in favor of Suggett; the Examiners-in-Chief, however, ruled in favor of Mudge. Upon appeal to the Commissioner of Patents, Suggett was sustained, but Green was given the patent on the process of driving the well. This was known as the "broad claim" and gave him exclusive rights to the drivewell, after Mudge unsuccessfully appealed to the Supreme Court of the District of Columbia.²⁰

The use of the drivewell device soon spread to the many parts of the United States where it could be used effectively.²¹ In some regions, however, it was not successful because of rock or quicksand formations, and in others because it was always necessary to strike a sufficient supply of water in the sands, otherwise no reservoir could be formed.²² However, the drivewell had advantages over the older types of wells in that it could be put down on any part of the farm by nearly any person, it seldom got out of order, it was inexpensive and quick to install, it prevented the water from becoming contaminated by surface materials, it could be installed in any other kind of well, it provided fresher and cooler water, and it increased the flow by eliminating the atmospheric pressure.²³ These advantages gave it a wide sale throughout the Nation, and by 1887 it was estimated that considerably more than a million were in operation.²⁴

Drivewell equipment was secured largely from Cowing & Company—a pump-and-well supply concern at Seneca Falls, New York—by agents and dealers who purchased county rights from the inventor.²⁵ Well diggers and hardware concerns were licensed to install the wells and collect the \$10 royalty which was the

²⁰ Green's patent No. 73,425, was granted on Jan. 14, 1868. It was reissued May 9, 1871 as No. 4,372. By 1880 there were about 150 different patents granted on drivewell points and other instruments connected with the device.—*Scientific American* (n.s.), 42:161 (Mar. 13, 1880); 1 *Federal Cases*, 868, 875. Green, as well as William D. Hunt, the inventor of the basic patent on barbed wire, lived in Cortland County, New York. *Glidden Barb Fence Journal* (DeKalb, Ill.), 2:2 (1880); 1 *Federal Cases*, 876.

²¹ 122 *U. S. Reports*, 48. The demand for this type of well was great in the drought areas of the West.—*Farmer's Review* (Chicago), 18:760 (Nov. 30, 1887). Many fire departments, railroads, and industries secured their water supply by this device.—*Scientific American* (n.s.), 42:161 (Mar. 13, 1880); 46:363 (June 10, 1882); *Railroad Gazette* (Chicago), 18:863 (Dec. 17, 1886).

²² *Cultivator and Country Gentleman* (Albany), 34:13 (July 8, 1869); *Ohio Practical Farmer* (Cleveland), 52:386 (Dec. 22, 1877).

²³ *Cultivator and Country Gentleman*, 34:32, 73 (July 15, 29, 1869); *Ohio Practical Farmer*, 52:402 (Dec. 29, 1877). An ordinary drivewell could be installed in a half day for about \$2 per foot including the pipe. 123 *U.S.S.C., Records and Briefs*, 1:145, 267; 1 *Federal Cases*, 870. Some farmers installed as many as ten of these wells in their "kitchens, cellars, yards, and fields."—*Scientific American* (n.s.), 48:320 (May 26, 1883).

²⁴ 122 *U. S. Reports*, 48; *National Live-Stock Journal* (w. ed.), 3:756 (Nov. 29, 1887). Some estimates ran as high as two million wells.—*Rural New Yorker* (New York), 46:788 (Nov. 26, 1887); *Iowa State Register*, Nov. 17, 1887.

²⁵ 123 *U.S.S.C., Records and Briefs*, 1:158, 256, 265; *Prairie Farmer* (Chicago), 59:373 (June 11, 1887); Green, *The American Driven Well*, 17.

usual charge for shallow wells.²⁶ Before long, however, there were many well diggers going about the country who claimed to have an invention of their own or to represent other patentees and promising farmers that royalty fees would not be collected.²⁷ Since the wells were easily installed and equipment easily secured outside of the regular channels, it was difficult to prevent infringements of the patent. In 1868, the Cowing concern issued a series of circulars over the inventor's signature informing the public of these illicit practices. Green said:

In order to bring my invention within the ability of everyone legally to use it . . . I have fixed the Royalty . . . Fee, at a very low rate, and I intend that no person shall use it without a license under my Patent; to this end I have employed counsel to institute legal proceedings against all persons who shall use this invention without such license.²⁸

Special agents and law firms were engaged to ferret out infringers and illicit users, but the expense compelled the inventor to assign parts of his patent to other parties who could assist him in the cost of litigation.²⁹

In 1871, a short time after the assignment, litigation was begun in earnest against eastern infringers, and sometime later it was begun in the west. In 1876, the first important decision in which the validity of the patent was sustained was rendered, the case being *Andrews v. Carmen* in the Circuit Court for the Eastern District of New York.³⁰ The defence attempted to show that Green had legally abandoned his invention to the public by waiting more than two years before making application.³¹ The complainants contended that the long delay of more than four years before applying for a patent was due to "trouble arising out of his indictment for shooting" and that these complications occupied all of his time between 1861 when the first drivewell was installed and 1868 when the patent was granted. The judge considered this trouble "unusual" and "sufficient to excuse a delay."³²

²⁶ *Keokuk Gate City*, Nov. 16, 1887; *Western Rural*, 20:160 (May 20, 1882). On deeper wells the royalty often ran as high as \$125.—*Western Rural*, 19:316 (Oct. 1, 1881).

²⁷ *Scientific American* (n.s.), 58:37 (Jan. 21, 1888); *Prairie Farmer*, 59:373 (June 11, 1887).

²⁸ Cowing & Company, *American Driven Well*, 9-10. Those who continued to use the patent after this notice, without paying the royalty, were to be fined 100 per cent.—Green, *American Driven Well*, 18.

²⁹ *Prairie Farmer*, 59:373 (June 11, 1887); *Age of Steel* (St. Louis), 42:10 (Nov. 19, 1887); *National Live-Stock Journal* (w. ed.), 3:738, 756 (Nov. 22, 29, 1887). Green assigned one-half of his patent to the Andrews Brothers of New York City. Territorial rights in Iowa were sold to Noah J. Parsons of Cedar Rapids. 123 *U.S.S.C.*, *Records and Briefs*, 1:1; *Rural New Yorker*, 46:788 (Nov. 26, 1887); *Prairie Farmer*, 59:373 (June 11, 1887). In 1871, after this assignment, the Andrews Brothers took over much of the litigation and in most of the legal suits their name appears as the complainants.—123 *U.S.S.C.*, *Records and Briefs*, 1:89, 243.

³⁰ 1 *Federal Cases*, 869; 11 *Federal Reporter*, 591.

³¹ The patent law under the amended Act of 1839 stated that no patent could be held invalid except on proof of abandonment of such intention to the public, or that, purchase, sale, or prior use had been for more than two years prior to the application.—122 *U. S. Reports*, 76; *New Jersey Law Journal*, 10:375 (December 1887).

³² 1 *Federal Cases*, 876, 868; 123 *U.S.S.C.*, *Records and Briefs*, 1:564.

The following year cases were begun in several western States. The patent was upheld in the case of *Andrews v. Wright* in the Minnesota Supreme Court,³³ thereby inciting Senator Windom of that State to deliver an excoriating speech in Congress against the patent system in general and the drivewell patent in particular. In reviewing the litigation he bitterly attacked the decision of the New York judge, remarking that the only reason the judge decided in favor of Green's patent was because of certain "extraordinary circumstances" in his life. The Senator stated that here

is a case where such vigilance was excused because through an unsuccessful attempt to commit murder the applicant became involved in so many troubles with his regiment, troubles with his neighbors, troubles with the grand jury, troubles with the criminal courts, with his government, with his church, and with his pastor, that he could not be expected to find time to give notice of his pretended invention by applying for a patent.³⁴

He suggested that the case was a "friendly" one, in which both sides were "conspirators," aiding the patentees to go out and collect royalties from "innocent" farmers.

With these two decisions to their credit the patentees moved with increased vigor. United States marshals, armed with decrees from the two courts, asked the farmers to either pay the fees or appear in court.³⁵ In some counties in the Middle West as many as three hundred individuals were sued for refusing to make payments.³⁶ As individuals the farmers were powerless to resist the collectors, so in some areas they organized anti-drivewell associations to raise funds, employ counsel, and fight the matter through the courts.³⁷ In Minnesota one association collected nearly \$10,000.³⁸ In Michigan the matter was regarded as so important that the State Grange undertook the defence. A law firm in Detroit was engaged, and all the subordinate granges were invited to solicit a dollar from every man who had a drivewell.³⁹ In Boston an organization was started by one hundred and fifty users of the patent for the purpose of collecting testimony and raising money to pay the costs of litigation.⁴⁰

The farmers of the West were encouraged in their struggle with the drivewell "patent sharks" by the successes of the St. Louis and Minneapolis millers who had united to fight the American Middlings Purifier Company.⁴¹ This company

³³ 11 *Federal Reporter*, 591.

³⁴ *Iowa State Register*, Jan. 7, Feb. 4, 1879.

³⁵ *Western Rural*, 20:160 (May 20, 1882).

³⁶ *Ibid.*, 25:769 (Nov. 26, 1887). It was estimated that 2,000 cases were pending in the various Courts when the final decision was made in 1887.—*Scientific American* (n.s.), 58:37 (Jan. 21, 1888). Suits were brought against farmers as far west as Oregon.—*Western Rural*, 21:361 (Oct. 13, 1883).

³⁷ *American Agriculturist*, 42:221 (May 1883).

³⁸ *Minnesota Farmer*, 2:113 (January 1879).

³⁹ *American Agriculturist*, 42:221 (May 1883); *Western Rural*, 19:316 (Oct. 1, 1881); 20:4 (Jan. 7, 1882).

⁴⁰ *Western Rural*, 20:233 (July 22, 1882); 21:167 (May 26, 1883).

⁴¹ The American Middlings Purifier Company was a joint-stock concern incorporated under the laws of the District of Columbia.—95 *U.S.S.C., Records and Briefs*, 126; 94 *U. S. Reports*, 355.

had purchased the William F. Cochrane patents for bolting flour and demanded fifty cents a barrel from all millers who used the process.⁴² The millers made "common cause," forming an organization to resist what they believed to be a fraudulent and unjust claim.⁴³ They raised a large fund through their State and national associations, employed legal talent, and, after a long and bitter fight, won a decision against the patent owners in 1879.⁴⁴ This victory stimulated the western farmers to combine and persevere in their fight against the drivewell patentees.

In the early eighties, several decisions were rendered in the lower Federal courts. In 1880, the patent was upheld in the Circuit Court of Kansas, and Judge Gresham did likewise in the Indiana case of *Hine v. Wahl*. In 1882, the Circuit Court of New Jersey also gave a favorable opinion.⁴⁵ The Indiana case was appealed to the Supreme Court, and in December 1882 a decision was reached by that tribunal in which eight Justices, though divided equally in their opinion, sustained the patent.⁴⁶ The decisions gave the patent owners what appeared to be a definite victory and a weapon to force out their royalties. Although some farmers capitulated and paid their fees, others continued the battle.

There were other Circuit Court decisions as well as two more from the Supreme Court before the curtain was rung down on this patent. In the early eighties, the case of *Andrews v. Hovey* was begun at Des Moines before Judges Shiras, Love, and Nelson. This was a test case for both Iowa and Minnesota as there were identical suits in these States and the Judges agreed to consider them jointly.⁴⁷ The farmers organized and went to work to raise money to employ legal talent.⁴⁸ They engaged Lake & Harmon, a law firm in Independence, Iowa. Jed Lake, who did most of the work on the case, introduced a great deal of new evidence. Under the law the patentee must exercise his legal rights where his invention had become known or abandon his claim. To establish

⁴² *Western Manufacturer*, 6:980 (Apr. 15, 1879); *Iowa State Register*, Mar. 26, 1879, Mar. 9, 1881.

⁴³ The Minneapolis Board of Trade stated in a resolution in 1877 that the Minneapolis millers alone would have to pay 1½ million dollars royalty and the country at large about 36 millions if this patent was sustained.—*St. Louis Times*, July 17, 1877.

⁴⁴ It cost the millers about \$75,000 to fight this case through the various courts.—*Keokuk Gate City*, Mar. 15, 1881.

⁴⁵ 11 *Federal Reporter*, 591-592; 12 *Federal Reporter*, 871.

⁴⁶ 122 *U. S. Reports*, 47-70.

⁴⁷ 123 *U.S.S.C., Records and Briefs*, 1:34, 55; *Western Rural*, 21:162 (May 19, 1883).

⁴⁸ *Western Rural*, 21:167 (May 26, 1883); *American Agriculturist*, 42:221 (May 1883). In Iowa an organization of about 85 farmers was established in 1879 in Butler, Buchanan, and Blackhawk counties. By 1881 it had collected and spent \$8,000 on this case. An organization of farmers in Minnesota contributed to the expense of the trial and farmers in Michigan gave their moral support to the contestants.—*St. Louis Journal of Commerce*, Mar. 29, 1879; *Burlington Hawkeye* (Iowa), Apr. 27, 1879; *Minnesota Farmer*, 2:113 (January 1879); *Iowa State Register*, Nov. 17, 1887; *National Live-Stock Journal* (w. ed.), 3:756, 771 (Nov. 29, Dec. 6, 1887); Benjamin F. Gue, *History of Iowa*, 140-142 (New York, 1903).

public use it was not necessary for the defence to cite more than one case of a drivewell in use prior to the date of the patent.⁴⁹

Evidence of such wells was therefore emphasized. Recollections of people who had seen and used them were introduced as well as old newspaper clippings. Books and technical magazines proved that the device was known several years before the patent was issued. In the case of a well at Independence, Lake's home city, some interesting pieces of evidence were introduced to show that it antedated Green's. By reference to the files of three Independence newspapers the defence demonstrated that it was used by the Cricket Club, a young men's organization which had been forced to disband when the majority of its members entered the Union Army in 1861. The May 30, 1866 issue of the *Independence Guardian* had an article describing a reservoir well created by driving a rod some 22 feet into the ground. On June 6, in the same paper, a reward was offered to anyone who could pump it dry, but after several attempts, the paper reported on June 13 that the "water still comes."⁵⁰

Evidence of prior wells in other States was also introduced. E. W. Purdy of Milwaukee testified that he had driven a well by the same process as that of the patentees as early as 1850, and a total of over two hundred persons were alleged to have had prior knowledge of drivewells at seventy-six different points in the United States.⁵¹ This evidence was so damaging that in the spring of 1883, a few months after the Supreme Court decision in the Indiana case, Judge Shiras read the majority opinion of the Iowa Circuit Court in which the complainant's bill was dismissed on the grounds that there were drivewells prior to those of the patentees.⁵² Judge Love concurred in this opinion but Judge Nelson dissented. The decision was important for two reasons; it was the only one in any of the lower courts that favored the defendants, and when the case reached the Supreme Court in 1887 it reversed the Indiana decision and overthrew the validity of the patent.⁵³

This Iowa case, besides revealing abundant evidence of prior wells, threw light on other interesting aspects of the struggle. George Hovey, of Independence, who, with his two brothers was the defendant in the case, had for a number of years been putting down wells for farmers in several counties in Iowa as well as in parts of central and northern Illinois. This small concern of well diggers had taken out a patent on a device similar to Green's, and in order to keep from

⁴⁹ 122 U. S. Reports, 76; *American Agriculturist*, 42:346 (July 1883).

⁵⁰ 16 *Federal Reporter*, 401-402; 123 U.S.S.C., *Records and Briefs*, 1:17-18, 25, 319, 326-327, 390.

⁵¹ 11 *Federal Reporter*, 596; *Cultivator and Country Gentleman*, 34:253 (Sept. 30, 1869); *Western Rural*, 21:361 (Oct. 13, 1883).

⁵² 16 *Federal Reporter*, 402; *Western Rural*, 21:162 (May 19, 1883). Judge Shiras was one of the few jurists who favored the farmers in patent suits. In their struggle with the barbed-wire patentees he decided against the patents at Dubuque in 1888.—*Dubuque Daily Herald*, Jan. 6, 1888; *Iowa State Register*, Jan. 6, 1888.

⁵³ "Instances in the Supreme Court . . . in which the result on a patent was different from the result in an earlier decision, are extremely rare, and can be counted on the fingers of one hand."—Patent Office Society, *Journal*, 19:619 (August 1937).

infringing his patent listed it as a "bored" well, that is, they sought to evade the patent by boring instead of driving until they came to the water-bearing stratum. Then, utilizing the advantages of the drivewell they drove the tube downward into the water-bearing sands a few inches to secure an airtight condition. With this device the brothers did a thriving business, for they collected no royalty fee from the farmers. When this firm was brought to trial some interesting facts were disclosed. Asked to produce the names of those on whose farms they had installed wells, Hovey refused, saying that the patent owners "would sue every man" and he himself "would not be safe in the hands of the people." Farmers had issued warnings and threats to anyone who would inform a royalty collector, and Hovey stated that should he do so there was no doubt that he, as well as the collectors, "would be mobbed."⁵⁴ This shows to what extent tension had developed in some rural communities during the period of litigation.

In the final phase of the struggle—between 1883 and 1887—there was little actual litigation but a great deal of activity on both sides. Three cases were appealed to the United States Supreme Court—one from the Connecticut Circuit Court, one from Ohio, and one from Iowa. For more than three years, the attorneys were busy gathering evidence for their final pleas. In the spring of 1887, two decisions were handed down. In the Ohio case of *Beedle v. Bennett* the Supreme Court decided that Green's patent had been infringed and that all users of drivewells must pay not only the royalty of \$10 but an additional \$2.03 in interest. From this opinion three out of eight Justices dissented. At the same time the Court ruled in *Andrews v. Eames*, from Connecticut, that the reissued patent of Green was valid. The same three Justices disagreed.⁵⁵ This was the third decision from the Supreme Court in favor of the patentees, not one of which was unanimous.

With these decrees from the highest court and the many favorable opinions of the lower courts, the patentees intensified efforts to collect their fees. Newspapers, especially in the east, advised the farmers "to accept the monopoly and pay the royalty"; eminent attorneys, who until that time had stood by the defendants, now told them to get out as cheaply as possible.⁵⁶ Several leaders compromised with Andrews and left the fight to others, certain that the Supreme

⁵⁴ 123 U.S.C., *Records and Briefs*, 1:60, 70, 79, 89, 97-99. Farmers were urged to "tar and feather" all royalty collectors who came into their communities.—*Western Rural*, 20:160 (May 20, 1882).

⁵⁵ 122 U. S. Reports, 40, 70, 71, 75; 15 *Federal Reporter*, 109. The sustaining of a reissued patent was something "not generally expected of the Supreme Court."—*Scientific American* (n.s.), 56:352 (June 4, 1887). This decision occasioned much rejoicing among the barbed wire patentees since they too were testing their patents in the Courts. F. W. Lehmann to C. G. Washburn, Des Moines, June 7, 1887, in the I. L. Elwood Papers, DeKalb, Ill.

⁵⁶ *Iowa State Register*, May 28, June 1, 1887; *National Live-Stock Journal* (w. ed.), 3:756 (Nov. 29, 1887). Farmers in Illinois were advised to cease fighting and pay the royalty fees. The *Fulton Journal* stated that it would be a hardship for "poor men to have to pay this sum as a tax on their water supply yet it is one of the beauties of our system of patent laws."—*Freeport Daily Journal* (Ill.), Aug. 19, 1887.

Court would never reverse its former decisions. In spite of this discouragement some farmers still continued to organize and support the cause. In the summer of 1887, meetings were held in various parts of Indiana "for the purpose of devising some plan to defeat the collection of this royalty."⁵⁷ About the same time, the president of the Ohio State Board of Agriculture called for a November meeting of drivewell owners in Columbus to lay plans for a united effort against collections in that State.⁵⁸ Eleven counties were represented, some of which already had protective organizations collecting dues and employing counsel.⁵⁹ A prominent jurist addressed the gathering, giving some legal points connected with the patent and urging the importance of organizing to fight the matter. A committee was appointed and the following resolution adopted:

Resolved, as the opinion of this meeting, that the demands made now by parties representing the Green patent are unjust and illegal and extortionate, and we advise parties interested to form organizations in every county and unit in defraying the expense of defending any suits that may be brought to enforce such demands.⁶⁰

In some Ohio counties there were more suits than in others; in Union County there were about three hundred, but none in Champaign. An estimated \$35,000 in royalties had been collected in Montgomery County alone and about \$100,000 in the entire State.⁶¹

In Michigan, following the Supreme Court decisions, excitement ran high and even the Governor was embroiled in the controversy. A strong supporter of the Grange, he advised the farmers of his State to fight the royalty collections. This action brought charges of "ungentlemanly" character against the Governor and the leaders of the State Grange from the patentee himself. Green attempted to show that the Governor was an "ignoramus"⁶² in a personal letter to a prominent granger of Tekonsha.

... we must exercise a little patience in behalf of a State which could elect a governor who could undertake to utter absurd law opinions in opposition to the Supreme Court of the United States. The State of Michigan is what she is because of the national supremacy behind her. Even these wonderful granges cannot go alone without the rest of us. Your very explosive Chief Executive may not be altogether an idiot, although he talks marvelously like one. . . . These grange magnates . . . are fishing for political favor, at the expense of the deluded farmer. . . . The wealth and general prosperity of the American people have

⁵⁷ *Farm Implement News* (Chicago), 8:20 (October 1887). In Missouri "whole communities have been agitated and worried by the intolerant exactions of agents representing the owners of the driven well patent."—*Age of Steel*, 42:10 (Nov. 19, 1887).

⁵⁸ *Western Rural*, 25:769 (Nov. 26, 1887); *National Live-Stock Journal* (w. ed.), 3:676 (Oct. 25, 1887).

⁵⁹ In Union County they had 540 members, 255 of whom had been sued; Williams County had 300 members, Marion 200, and Tuscarawas 34. Dues ranged from \$1.50 to \$4.—*Western Rural*, 25:769 (Nov. 26, 1887).

⁶⁰ *Western Rural*, 25:769 (Nov. 26, 1887).

⁶¹ *National Live-Stock Journal* (w. ed.), 3:738 (Nov. 22, 1887).

⁶² N. W. Green to Rufus Osborn, Boston, Mass., Oct. 14, 1887, in *Prairie Farmer*, 59:764 (Nov. 26, 1887); *Western Rural*, 25:810 (Dec. 10, 1887).

been to a greater degree due to patents and patented improvements than to agriculture. In saying this I do not seek to belittle agriculture. This is not saying the farmers have no rights; but it will go without saying, that the farmer has no more right to use my patent, without my consent, than he has to use my horse. . . . My patent is as much property as the farmer's land or crops; and the governor of Michigan proves himself an idiot or a knave, when he says otherwise.⁶³

In Illinois a good deal of pressure was brought to bear, especially in the northwest where many drivewells were in use.⁶⁴ Agents went among the farmers "frightening" them "into paying the royalty." In the southern part of Whiteside County alone "over fifty owners of driven wells" were brought to trial, but many farmers still refused to make settlement. Mass meetings were held in most of the townships in the northern counties "for the purpose of taking united action in the matter of settling the drive well claims."⁶⁵

The appeal of the Iowa case, *Andrews v. Hovey*, to the Supreme Court was still pending. Following the decisions of the spring of 1887 many farmers in Iowa dropped out but a few stayed in the fight and made even larger contributions.⁶⁶ Several leading editors encouraged them to continue their support of Lake & Harmon, for, as one stated, it would save nearly a half million dollars for Iowa alone if they could reverse the decision.⁶⁷ In the summer of 1887, Lake traveled through Iowa, Michigan, Illinois, and New York digging up more evidence and testimony on the prior wells that he had emphasized in the Iowa case, and in late July he went to Washington to make the final arrangements for printing the record.⁶⁸ In his argument before the Court he produced five witnesses who testified that the patentee had known of the public use of several of his drivewell devices more than two years before he applied for a patent.⁶⁹ "We proved," said Lake, "that he allowed others to use it; the other cases didn't prove it."⁷⁰

On November 14, 1887, Justice Blatchford delivered the unanimous opinion affirming the appeal from the Iowa Court.⁷¹ Word was immediately flashed by wire throughout the Nation and there was great rejoicing. The *Prairie Farmer*

⁶³ *Michigan Farmer*, 28:4 (Nov. 21, 1887).

⁶⁴ It was estimated that there were between 2,000 and 3,000 drivewells in Henry and Whiteside counties and probably around 500,000 in the whole State.—*National Live-Stock Journal* (w. ed.), 3:597 (Sept. 20, 1887); *Freeport Daily Journal*, Aug. 19, 1887.

⁶⁵ *Freeport Daily Journal*, Aug. 19, Nov. 23, 1887; *Keokuk Gate City*, Nov. 16, 1887.

⁶⁶ Eleven farmers, according to the *Waterloo Reporter*, subscribed from \$100 to \$200 apiece. In all about \$2,000 was contributed toward the expense of the Iowa suit in the Supreme Court. *National Live-Stock Journal* (w. ed.), 3:756, 771 (Nov. 29, Dec. 6, 1887).

⁶⁷ *Iowa State Register*, June 1, 1887; *Western Rural*, 25:494, 810 (July 30, Dec. 10, 1887).

⁶⁸ *Iowa State Register*, Nov. 17, 1887.

⁶⁹ It was shown that Green's drivewell was in use in Independence, Milwaukee, Preble, and Cortland, New York, for some time prior to his application for a patent.—123 U.S.C., *Records and Briefs*, 2:9; *Scientific American* (n.s.), 58:37 (Jan. 21, 1888); *Cultivator and Country Gentleman*, 52:893 (Nov. 24, 1887).

⁷⁰ *Iowa State Register*, Nov. 17, 1887.

⁷¹ 123 U. S. Reports, 267, 275.

stopped its presses to include a telegram from its Washington correspondent since it had from ten to fifteen thousand readers interested in the outcome.⁷² In the editor's brief announcement he recommended that the farmers "catch every fellow who has collected any such 'royalties' before he can get out of town and make him disgorge." At Morrison, Illinois, the farmers attempted that very thing. A collector from New York and his legal staff had been doing "a thriving trade with the farmers" in that vicinity, but before they could contact him he withdrew "the balance of the money deposited with the First National Bank at Morrison," and "left for parts unknown."⁷³

In some areas farmers talked of recovering their royalties from the patentees by bringing suit against them, but the latter did not propose to die easily and gave notice that they would contest any attempt at recovery by carrying a case to the Supreme Court. Moreover, the farmers were advised by sounder counsel to make a most searching legal investigation before they went into court, to be sure that the patentees had attachable property.⁷⁴ The farmers rested, although the appellants asked the Supreme Court for a rehearing on the grounds that numerous Circuit Court opinions and three decisions of the Supreme Court had been in their favor.⁷⁵ After some deliberation the petition was denied, and thus came to an end the long struggle between the farmers and the drivewell patentees.

⁷² *Prairie Farmer*, 59:748, 764 (Nov. 19, 26, 1887).

⁷³ *Freeport Daily Journal*, Nov. 23, 1887; *Keokuk Gate City*, Nov. 16, 1887.

⁷⁴ *Farm and Home* (Springfield, Mass.), 8:422 (Dec. 15, 1887).

⁷⁵ 124 *U. S. Reports*, 695, 719.

CHANGING ECONOMY AND RURAL SECURITY IN MASSACHUSETTS

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In rural Massachusetts, the sources of security have undergone profound transformations as successive changes have occurred in the local economy. The concept of security is traditionally linked with socially acceptable employment enabling a man to maintain himself and his family in accordance with prevailing living standards. The feeling of security, however, does not come merely through having the immediate income to provide food, clothing, and shelter. It also comprehends an anchorage in the community, and a minimum of anxiety over economic hazards.¹

Although it would be difficult to fit the history of rural Massachusetts into a fixed, or sequential framework, for the purposes of this study it seems best to divide the last three centuries into three periods: 1630-1825, 1825-1895, and 1895 to the present. The first period was characterized by subsistence agriculture and handicraft economy; the second, by commercial farming and an expanding industrial economy; and the third, by a declining industrial order and a renascent agriculture. These changes wrought corresponding modifications in the sources and conceptions of security. Cultural lags were much in evidence; each period revealed discrepancies between economic facts and public awareness and between public awareness and group action. Such lags still exist, explaining many reactions to contemporary problems in Massachusetts.

In the first period, between 1630 and 1825, the predominant cultural motif was a subsistence economy with families living and depending on small self-sustaining farms. Even specialized craftsmen such as shoemakers, millers, and blacksmiths, as well as clergymen and shopkeepers, tilled their own soil, for "in most of New England there was no whole-time occupation by which a man could earn a living for himself and his family, save farming."² Clothing, utensils, tools, and nearly all household goods were made at home. "The rule that the farm should supply all that the farm consumed had acquired the validity of an article of religious faith. To buy from outside goods which might be produced at home was held to be not only bad economy but also doubtful morality."³

One farm differed little from another in the kind of crops grown, in the tech-

¹ J. H. Kolb, "Social Security as a Function of Society," *Rural Sociology*, 3:11-19 (March 1938); William Henry Beveridge, *Unemployment; a Problem of Industry*, 1-3 (London, 1930).

² James Truslow Adams, *New England in the Republic, 1776-1850*, p. 189 (Boston, 1926). To be sure, such areas as the Connecticut Valley, Nantucket, and Cape Cod early deviated from the prevailing practices, including fishing and commerce in their means of gaining a livelihood, but these groups constituted a minority of the population. See Frederick Freeman, *The History of Cape Cod* (Boston, 1862).

³ Percy Wells Bidwell and John I. Falconer, *History of Agriculture in the Northern United States, 1620-1860*, p. 254 (Washington, 1925).

nique of operation, and in all those matters pertaining to making a living. The vast majority of the population resided in small but growing agricultural communities. These steadily increased both in number and size. In 1765, 113 rural towns had an average population of 915; by 1825, there were 191 with an average of 1,288 persons. Made up of homogeneous people with common traditions, rural towns, for the most part, greatly resembled one another in their outlook and way of life.⁴

The disasters of this early period have become an integral part of the traditions of America. The dramatic Revolutionary War years witnessed the devastation of flourishing rural towns. Productive manpower was decimated and the expropriation or destruction of food supplies brought rural Massachusetts to the verge of starvation. Equally far-reaching and no less significant were the threats of the post-war years. Money needed to pay taxes could not be readily obtained, and assessments for public emergencies were frequent and unpredictable. Non-resident land speculators, with little concern for the needs of the communities, controlled the tax rate for some towns. The value of land and money was subject to severe fluctuations, often resulting in the loss of hard-earned savings.⁵ The crops were affected by brief droughts and cold, and often left the farmer with scarcely enough food to carry his family through the winter months. A man's failure to meet a debt meant a jail sentence with no chance of working off the obligation. The only alternative was to take a pauper's oath that he possessed less than £5. Over three thousand persons were annually imprisoned for debts, largely for sums of less than \$20.

Such harassments led to dismay and anxiety which eventually found release in protest and overt action as insecurities continued unabated. Shays' Rebellion seemed to many farmers the only answer to the pressing poverty and apparently insurmountable obstacles to the achievement of security.⁶

Despite these shortcomings, life was viewed as more promising than it was in the Old World or during the earlier years of settlement. Few doubted that security for the average man was ultimately attainable. "Neither his non-descript past nor his humdrum present provided a basis for boasting, even with his characteristic temerity. Accordingly he always looked to the future, which was unhampered by realities, and let his imagination have full sway."⁷

Under Puritan code, frugal living and steady work at a fixed calling were cardinal virtues rewarded by happiness in this world as well as in the next.⁸ Conse-

⁴ See William B. Weedon, *Economic and Social History of New England, 1620-1789*, p. 271-272 (Boston, 1890); Adams, *New England in the Republic*, 187.

⁵ See Charles H. J. Douglas, *The Financial History of Massachusetts; From the Organization of the Massachusetts Bay Colony to the American Revolution* (New York, 1892).

⁶ See also Walter A. Dyer, "Embattled Farmers," *New England Quarterly*, 4:460-481 (July 1931).

⁷ Everett E. Edwards, "American Agriculture—the First 300 Years," U. S. Department of Agriculture, *Yearbook*, 1940, p. 173.

⁸ According to Samuel Eliot Morison, *The Puritan Pronaos* (New York, 1936), "Puritanism was unascetic; it came to terms with this world. Under the medieval church you could only approach perfection (short of Heaven) by withdrawing from this world and en-

quently, less fortunate individuals lost status and became the objects of numerous pressures designed to reform "the erring members." Principles of the Elizabethan poor laws were applied in legislation enacted to reduce dependency by discouraging vagrancy and willful idleness, by requiring every able-bodied male to have a fixed occupation, and by demanding habits of frugality and industry. In keeping with the English tradition, each town was made responsible for the care of its own poor.⁹ The laws authorized towns to undertake measures to insure that "all children, youth, and other persons of able body living within the same town, or precincts thereof (not having estates otherwise to maintain themselves) do not live idly or misspend their time in loitering, but they be brought up or employed in some honest calling, which may be profitable to themselves and the publick."¹⁰ As Cotton Mather said, "The poor that can't work are objects for your liberality, but the poor that can work and won't the best liberality for them is to make them."¹¹ In keeping with this policy, any member of a community falling in want through a misfortune not of his own making was readily given aid. "What seems on the written page like hard and begrudging charity was, in fact, the even-handed justice of townsfolk who themselves felt the pinch of poverty and who extended relief to their less fortunate neighbors without stint, resorting to the public treasury only when the burden dragged too heavily."¹² Persons in need were given emergency aid by anyone who was in a position to help, and failure to do so was deemed an act of civil disobedience. Thus, in 1655, a court convicted a man of the crime of "uncharitableness to a poor man in distress."¹³ Each town not only accepted responsibility but took pride in its capacity to care for its needy and firmly believed that other towns should do the same for their own unfortunates.

Communities took many measures to attain self-sufficiency. Needed craftsmen were welcomed; shoemakers, blacksmiths, curriers, carpenters, bricklayers, masons, wheelrights, and glaziers received grants of a house and workshop, land, money, and tax exemptions for a specified time upon promise to reside in the community.¹⁴ However, not everyone was welcome; towns became increasingly

tering the priesthood or a monastic order. But puritanism taught that a man can serve God quite as effectually in his chosen calling, as by entering the sacred ministry; that a farmer or merchant who conducted his business according to Christian ethics was more agreeable in the sight of God than one who withdrew from the world and escaped his social responsibilities by a celibate or monastic life."—p. 8. See also Vernon Louis Parrington, *The Colonial Mind, 1620-1800*, p. 267-268 (New York, 1927).

⁹ Helen I. Clarke, *Social Legislation; American Laws Dealing with Family, Child, and Dependent*, 417 (New York, 1940).

¹⁰ John Cummings, *Poor-Laws of Massachusetts and New York*, 27 (New York, 1895).

¹¹ Cotton Mather, *Magnalia Christi Americana*, 1:102 (London, 1702).

¹² Robert W. Kelso, *The History of Public Poor Relief in Massachusetts, 1620-1920*, p. 33 (Boston, 1922); Marcus Wilson Jernegan, *Laboring and Dependent Classes in Colonial America: 1607-1783*, p. 209 (Chicago, 1931).

¹³ Cited in George Francis Dow, *Every Day Life in the Massachusetts Bay Colony*, 29 (Boston, 1935).

¹⁴ Thomas Jefferson Wertenbaker, *The First Americans; 1607-1690*, p. 60-77 (New York, 1927).

sensitive to the influx of potentially dependent individuals. More and more, they rejected the thesis that immigrant paupers were a community asset.¹⁵ After 1642, undesirable newcomers were formally "warned" to leave; failure to do so absolved the community of all responsibility for their dependency. The Plymouth Colony acts of that year required formal exception to an arrival in order to prevent his becoming a legal resident entitled to relief, and some towns warned all newcomers.¹⁶ Later, other restrictions were added, culminating in the settlement laws of 1794 which remained in effect for fifty years.¹⁷ Under these acts persons who brought in strangers were liable for their support, destitute persons not acceptable as inhabitants were returned to their previous legal residence, and ten years residency and the possession of a fixed inheritance or adequate permanent employment were required for acceptance into town membership. To ensure an adequate supply of the necessities of life, and to protect the consumer against shoddy goods and excessive costs, a plethora of legislation was enacted. Prices, quality, and the wages of employees were minutely regulated.¹⁸

Although the techniques varied with the nature of the immediate circumstances, throughout this early period there prevailed an unshakeable faith that existing handicaps eventually would be overcome. There was no thought that the subsistence agricultural economy could not provide an enduring security for all frugal, industrious citizens. Poverty was seen as a reflection of the shortcomings of individuals rather than of the social order itself. The allowed exceptions were those cases in which catastrophes beyond human control occurred, such as the sudden death of a breadwinner or a severe drought.

By 1825, a new economy was taking shape in a form that continued until 1895. The half century preceding the Civil War saw far-reaching changes in the methods of securing a livelihood.¹⁹ In less than two generations, commercial agriculture and the factory supplanted to a large degree the subsistence farm and handicraft economy; "earning a living" replaced "making a living."

In the seventy years between 1825 and 1895, the number of industrial factories in Massachusetts grew erratically from a few hundred to nearly five thousand. Even though the number of employees did not expand as sharply, the size of the group never fell below 20,000 in any year and several times it reached 50,000. Concomitantly, the proportion of rural workers in farming steadily diminished; by the time of the Civil War, only 65 percent and by the close of the century less than 35 percent of the rural population were primarily engaged in agriculture.

¹⁵ Franklin B. Sanborn, *Public Charities of Massachusetts*, 3-4 (Boston, 1876).

¹⁶ See, for example, Frances Everett Blake, *Worcester County, Massachusetts Warnings: 1737-1788* (Worcester, 1899).

¹⁷ See Robert Harvey Whitten, *Public Administration in Massachusetts* (New York, 1898).

¹⁸ Richard B. Morris and Jonathan Grossman, "The Regulation of Wages in Early Massachusetts," *New England Quarterly*, 11:470-500 (September, 1938). See also James Truslow Adams, *Provincial Society, 1690-1763*, p. 45 (New York, 1938).

¹⁹ For details, see Percy W. Bidwell, "The Agricultural Revolution in New England," *American Historical Review*, 26:683-702 (July 1921).

Abandoned farmsteads became a characteristic feature of the landscape in several sections of the State.²⁰

The changing economy made inroads on established class lines and seemed to open avenues to wealth and social prestige for every ambitious, able-bodied man. Rural families aspired to climb the newly constructed economic ladder through ownership and operation of a mill, or some allied activity.²¹ The rhythm of town life was profoundly changed. The redefinition of prestige, the quickened social mobility, the routine of factory work, and the reorganization of farming practices meant heterogeneity of thought and behavior. The effects of the new economy on rural life were far from uniform. Some towns preferred holding fast to the traditional ways, while others sought to combine portions of the old and the new. However they reacted, no community was immune, even the most isolated became acutely aware of the changes under way.²²

In these seven decades, the State's population living in rural towns fell from 78 to 19 percent, although 35 new rural towns were established and the average community increased in numbers from 1,288 to 1,421.

Despite the spirited discussion on the merits of the commercial economy, the hazards implicit in it were largely unanticipated. The new industrial sections of rural towns, paying what were regarded as lucrative wages, attracted the farm youth, leaving the farm operator short handed or compelled to pay wages he could not afford. Commercial agriculture was hampered by lack of capital, cheap credit, marketing facilities, and the experience needed to bargain effectively and deal impersonally through the medium of money. The average Massachusetts farmer did not know what crop would bring a profit. It was an expensive lesson to learn that he could not compete with the wheat, pork, wool, sheep, hops, butter, and cheese shipped in from the West and that he must specialize in those commodities in which such competition was at a minimum. Not that advice from agricultural leaders and public agencies was lacking; it was abundant and also confusing. The first State Commissioner of Agriculture, Henry Colman, urged all farmers to preserve their self-sufficiency in their own household necessities while the heads of the newly organized farm societies were stressing specialization. The average farmer had no means to appraise the diverse theories of farm management. As a result, farmers tried every crop and type of stock heard about. One fad succeeded another for "A new spirit was stirring among the farmers. They began to feel that they were living in a period of great changes, and they were unwilling to lag behind the age."²³

Farmers occupying land sufficiently productive for family needs, but marginal

²⁰ For a description, see Massachusetts Bureau of Labor Statistics, *Annual Report* (1891), 21:179-257.

²¹ Percy Wells Bidwell, "Rural Economy in New England at the Beginning of the Nineteenth Century," Connecticut Academy of Arts and Sciences, *Transactions*, 20:243-399 (New Haven, 1916).

²² See H. B. Hall, "A Description of Rural Life and Labor in Massachusetts" (MS., Ph.D. Thesis, Harvard University Library, 1918).

²³ Bidwell, "Agricultural Revolution in New England," 686.

in terms of a commercial agriculture, had to choose between abandoning their established homesteads for better opportunities elsewhere, or resigning themselves to a lower economic status. The decision severed family ties in many cases, ambitious sons and even daughters in tradition-bound homes launching out for themselves, seeking jobs in local factories or in the growing industrial cities nearby or leaving for better lands in the opening West.

The disruption of traditional patterns gave rise to unique uncertainties and anxieties. The old ways had provided assurance of the necessities of life, the new promised greater material comfort but threatened the loss of all savings and property. "The self-sufficient farm family possessed a high degree of economic security at a low level of living."²⁴ The commercial farm family possessed a higher level of living at a lower degree of security.

Factory hands missed the feeling of belonging and counting in the community. In the earlier period, town membership meant a definite niche in the social life of the group, solicitude in personal misfortune, sympathetic aid in distress, and an active role in the formation of group plans. Though factory jobs brought increased income, they did not bring a rise in social prestige.

many Americans entertained a strong prejudice against manufacturing. People so engaged were thought to degenerate both physically and morally. In popular opinion their dependence on the will of employers made them servile, their irregular employment made them irregular in habits, and their material surroundings deteriorated their health, stature, and bodily vigor. . . . Factory employees were supposed to lack the economic independence, the moral fiber, and the physical aggressiveness required to defend political liberty.²⁵

Nor did "good money" preclude dependency, for from the very outset business dislocations occurred. Thus rural Massachusetts shared with other parts of the Nation the discomforts of the financial crisis of 1836-37. Hardly a boot and shoe manufacturer escaped bankruptcy, half of the spindles ceased operation, unemployment became widespread, and poverty forced 3,500 rural families to seek public assistance.

The number of dependency cases and the proportion of the rural population requiring relief more than doubled. The towns and the State were forced to enlarge their expenditures for public assistance, reluctant as they were to do so.²⁶ As a consequence, public concern over the likelihood of developing a permanent dependent class became intense. The legislative committee of 1821, under the distinguished leadership of Josiah Quincy, urged the use of almshouses "having

²⁴ Ralph Turner, "The Cultural Setting of American Agricultural Problems," U. S. Department of Agriculture, *Yearbook*, 1940, p. 1022.

²⁵ Victor S. Clark, *History of Manufactures in the United States, 1607-1860*, p. 581 (Washington, 1916).

²⁶ Thrifty towns often used ingenious devices to place as many cases as possible on State relief rolls. One investigation revealed "that during the suspension of work, whole manufacturing villages had been enrolled as state paupers; that in some small towns trifling gifts to families were made the basis of charging all their members to the state for the entire winter."—Massachusetts State Board of Health, Lunacy and Charity, *Annual Report*, cxxviii (Boston, 1881).

the character of workhouses" as the most effective technique for deterring dependency among the able-bodied poor.²⁷ Accordingly, in 1823, the State created a chain of houses of correction for the unemployed in need of public aid. The hope that this measure would prove a solution of the growing dependency was not realized. The failure of the workhouses to rehabilitate the able-bodied paupers and to restore them to self-dependency led to their gradual abandonment; by the 1880s, there were more relief cases outside than inside these institutions.

Unrest over the lack of security found expression in various militant reform movements, the early organization of a labor party, and spirited debate.²⁸ A new "humanitarianism" appeared, reflecting the general feeling that "whatever the accidental circumstances might be in which a man was placed, he should nevertheless be treated as a man, and given every possible opportunity."²⁹ This took concrete form in agitation for public aid to the handicapped; emphasis shifted from discouraging paupers through rigid penalties to the granting of aid to all victims of social maladjustments. It was assumed that all men were acquisitive enough to seek self-sufficiency. The numerous reform measures, though far from effective, gave rise to the feeling that efforts were being made to reduce the insecurities of life.³⁰ Hence it was taken for granted that once society was duly adjusted so that everyone would have opportunity to raise his economic status, a reasonable degree of security would be generally available.³¹

The depression of 1893-95 denoted the onset of the third period in the socio-economic life of rural Massachusetts. The following decades witnessed a general disintegration of rural industry and renaissance of agriculture, which, in turn, brought far-reaching changes in the sense of security in rural towns of the Commonwealth.

The debacle of 1893 was the first in a series of recurrent dislocations in the manufacturing of Massachusetts, which affected the most important and charac-

²⁷ Sophonisba P. Breckinridge, *Public Welfare Administration in the United States*, 37 (Chicago, 1927).

²⁸ Arthur B. Darling, "The Workingmen's Party, 1833-1834," *American Historical Review*, 29:81-86 (October 1923).

²⁹ Adams, *New England in the Republic*, 371.

³⁰ Sarah Scovill Whittelsey, *Massachusetts Labor Legislation: An Historical and Critical Study*, 9 (American Academy of Political and Social Science, Annals, Supplement, January 1901).

³¹ According to Vernon Louis Parrington, *The Romantic Revolution in America, 1800-1860*, p. 271 (New York, 1927), "The revolutions in thought that lie between the eighteenth century with its aristocratic rationalism that conceived of human nature as evil, and the nineteenth century with its middle-class economics that conceived of human nature as acquisitive, are more clearly defined in New England and more sharply differentiated, than elsewhere in America. The flood of romantic speculation with its humanitarian emphasis on the potential excellence of man and the equality of human rights, that in Europe had diffused itself widely, in Massachusetts flowed into narrow channels prepared by Puritan discipline, and swept away habits of thought that had dominated New England for two hundred years."

teristically rural industries such as textiles, foods, paper, and boots and shoes. Numerous shut-downs meant severe curtailments of municipal revenues, the loss of jobs for large portions of the gainfully employed, and an unprecedented growth of dependency. In 1895, there were 3,571 factories in operation; in 1905, 1,207; in 1915, 767; in 1925, 621; and by 1935, only 425.

The closing of small self-operated concerns often resulted in a shift from owner-worker to factory hand. The average worker no longer thought of opening his own mill as a means of advancement. His future became identified with a larger mill in which his role precluded an active part in its decisions. The smaller number of plants and the increase in the size of the labor market intensified the competition for work in good times and bad.

Irregular employment was the lot of half the workers. In 1895, there were 15,984 positions in rural industries involuntarily vacated during part of the year; in 1935, there were 18,448 positions in this category. In the last two decades of the nineteenth century, 44.5 percent of the rural labor market consisted of industrial workers, and 37.5 percent were agricultural workers, but of those unemployed, 63.2 percent formerly worked in industry and 20.9 percent in agriculture. The same difference was evidenced in the State Unemployment Census of 1934. Industrial workers made up 60.8 percent of the gainfully employed, and agricultural, 12.9 percent, yet 79.5 percent of the unemployed were from the former group and only 3.2 percent from the latter.

Stranded industrial populations became baffling problems in rural Massachusetts. In the depths of the last depression, twenty-three towns lost all of their factories, either through migration or closing. Attempts to encourage new concerns proved unsuccessful in many cases. Absentee owners were indifferent to the welfare of the local group.³²

After 1929 two-thirds of all the public relief cases were factory workers as public assistance cases climbed to new heights. In 1895, there were 7,221 recipients of aid and in 1935, 30,002. In proportion to the total rural population this involved an increase from 2.52 to 9.78 percent.

A 1935 survey revealed that 88 percent of all Massachusetts households receiving relief were needy for reasons growing directly out of economic conditions.³³ That there had been no sudden collapse of the morale of the workers was evident in their efforts to remain self-dependent. Only 4 percent of those forced to accept relief, sought it in the first month after loss of employment, while half of the group continued unaided for six months. In 1934, the average

³² For case studies, see Katharine Du Pre Lumpkin, *Shutdowns in the Connecticut Valley; A Study of Worker Displacement in the Small Industrial Community* (Smith College Studies in History, v. 19, nos. 3-4, Northampton, April-July 1934); Vera Shlakman, *Economic History of a Factory Town, a Study of Chicopee, Massachusetts* (Smith College Studies in History, v. 20, nos. 1-4, Northampton, October 1934); Agnes Hannay, *A Chronicle of Industry on the Mill River* (Smith College Studies in History, v. 21, nos. 1-4, Northampton, Mass., October 1935).

³³ John Useem, "A Study of Social Security in the Rural Communities of Massachusetts," 7-114 (MS., Ph.D. Thesis, University of Wisconsin Library, 1939).

annual wage of industrial workers was \$910.29, 22 percent less than in 1929. Attempts to find jobs in more prosperous neighboring communities met with discrimination, for each town felt that its primary responsibility was towards its own members.³⁴ With the general curtailment of employment in Massachusetts cities,³⁵ commuting or migration from rural areas presented no opportunities.

The unemployed industrial worker was shocked and confused. To enter farming meant a step downward in the social and economic scale and implied identification with foreign-born farmers. It meant a modification of all the symbols of status, but few have been willing to make them, and so the factory worker has been patiently waiting, hoping that a revival of the Nation's business will bring a recrudescence of local industries. There has been surprisingly little despair, for confidence in the future has not been shattered. The historic-minded populace view past successes against apparently insurmountable odds as unmistakable evidence that recent insecurities will eventually be overcome.

With the onset of the present century, agriculture in Massachusetts had a considerable revival. Although the percentage of land in farms dropped from 58.3 to 39.0 between 1890 and 1930, and the total number of individual farms also decreased, these facts are largely explained by the abandonment of sub-marginal areas which could not provide their population an acceptable standard of living.³⁶ However, the population per hundred acres of farm land, rose steadily from 75 in 1890 to 212 in 1930. While the average farm acreage fell from 87.7 to 78.3, the value per acre went from \$42.54 to \$130.26, and the average farm valued at \$3,710 in 1890 was estimated to be worth \$10,205 in 1930. Despite the fact that one-third of the land in agricultural areas was owned by nonresidents,³⁷ Massachusetts had the lowest percentage of farm tenancy of any State in the Nation; in 1890, 81 percent of the farms were operated by their owners and 88 percent in 1930.

Part-time farming, in evidence since the rise of industry, became widespread after 1900.³⁸ Many a frugal industrial household found it advisable to cultivate a small plot of land; few, however, received from it sufficient to tide the family over prolonged unemployment.³⁹ Hence the long-time trend was one of in-

³⁴ Carle C. Zimmerman and Merle E. Frampton, *Family and Society, A Study of the Sociology of Reconstruction*, 296-357 (New York, 1935).

³⁵ Donald H. Davenport and John J. Croston, *Unemployment and Prospects for Employment in Massachusetts with Particular Reference to Manufacturing Industries*, 10-12 (Harvard University Graduate School of Business Administration, *Business Research Studies* 15, Boston, 1936).

³⁶ See Ralph Hall Brown, "The Economic Geography of the Middle Connecticut Valley of Massachusetts" (MS., Ph.D. Thesis, University of Wisconsin Library, 1925).

³⁷ David Rozman, "Recreational and Forestry Uses of Land in Massachusetts," Massachusetts Agricultural Experiment Station, *Bulletin* 294, p. 5 (Amherst, January 1933).

³⁸ David Rozman, "Part-Time Farming in Massachusetts," Massachusetts Agricultural Experiment Station, *Bulletin* 266 (Amherst, October 1930).

³⁹ John Useem, "Does Decentralized Industry Mean Greater Security? The Case of Massachusetts," *Rural Sociology*, 6:40-56 (March 1941).

creasing numbers, with occasional reversals in periods of recession. Profitable markets for farm products have been close at hand, for there has been a constant local demand at premium prices for the very best products and an equally consistent demand for poorer crops at low prices.⁴⁰

In recent years, agriculture measured in terms of money invested and number of persons employed, has become the second largest economic enterprise in Massachusetts, exceeded only by the manufacture of cotton goods. "Agriculture now holds a more important place and provides a greater real income to New England than it did 50 years ago—a triumph of selection, increased efficiency, and specialization."⁴¹

Farming was not, however, insulated against the recent depression. The gross agricultural income dropped 35 percent between 1929 and 1932, and then slowly climbed back 23 percent in the next five years. The debt burden mounted, the number of farm mortgages increased 30 percent, and the total amount in farm mortgages rose 16 percent. In this same period, the combined rate of the liquidation of farms for bankruptcy and of the foreclosures for failure to meet mortgages and taxes more than doubled, going from 8.4 to 17.1 per 1,000 farms. Simultaneously, the average value of farm land declined from \$130.26 to \$116.44 per acre and the average value per farm fell from \$10,205 to \$7,285. The farmers of the State were forced to assume heavier tax obligations, despite the fact that they were already taxed more than any other American farmers.⁴² With all these economic reversals, farmers constituted only 13.1 percent of the relief population. Large numbers of ambitious foreign-born and their children settled in rural Massachusetts with farm ownership as their ultimate goal.⁴³

This reversal of trend led a number of writers to conclude that this area had become "a rubbish heap of burnt-out energies, suppressed or frustrated instincts, bankrupt culture, social decay, and individual despair."⁴⁴ Similarly the rural town was depicted as a feeble unit with no vital role in modern society.

An objective appraisal of recent events indicates that such interpretations have little validity. The resilient communities have continued their growth through the present period; in 1895, the average rural community had 1,421 inhabitants; in 1935, it contained 1,741 persons. The decline of the proportion

⁴⁰ Frederick V. Waugh, "The Marketing of New England's Farm Products: Demand Factors," 175, in *New England's Prospect: 1933*, edited by John K. Wright (New York, 1933).

⁴¹ Charles E. Artman, "Industrial Structure of New England," U. S. Department of Commerce, *Domestic Commerce Series* 28, p. 3 (Washington, 1930).

⁴² Hubert W. Yount, "Farm Taxes and Assessments in Massachusetts," Massachusetts Agricultural Experiment Station, *Bulletin* 235 (Amherst, April 1927).

⁴³ Alexander E. Cance, "Immigrant Rural Communities," *American Academy of Political and Social Science, Annals*, 40:69-80 (March 1912); J. L. Hypes, "Recent Immigrant Stocks in New England Agriculture," in *New England's Prospects: 1933*, p. 189-205 (New York, 1933).

⁴⁴ Bernard de Voto, "New England, There She Stands," *Harpers Magazine*, 164:405 (March 1932); Louis Adamic, "Tragic Towns of New England," *ibid.*, 162:748-760 (May 1931); Hermann Keyserling, "Genius Loci; The Civilization of these United States," *Atlantic Monthly*, 144:304 (September 1929).

of the State's population residing in rural areas from 19 to 9 percent did not mean that the rural towns no longer attracted immigrants or that the population failed to reproduce itself.⁴⁵ Rather it reflected the passing of some rural communities into the urban class and the general growth of Massachusetts cities. Although a few industrial towns and other areas have collapsed,⁴⁶ no agricultural community has disintegrated. There were 224 rural towns in 1895 and 229 in 1935. The vast majority of the rural population have never become dependent, despite the hard times of recent years. Through mutual aid, exchange of work, sharing of goods, and public work projects, most towns have weathered the storms with surprisingly little disorganization or chaos. It is still true that "The most fundamental principle of public aid in Massachusetts is that the responsibility for the relief of persons in distress lies upon the community where the distress is found."⁴⁷

After 1895, the belief that public assistance was primarily an emergency measure to tide dependents over short periods of dependency was gradually abandoned. A series of exhaustive public hearings conducted by committees of the State legislature led to the passing of laws designed to insure workers against recurrent risks. By 1935, the year in which the Federal Social Security Act was passed, the Commonwealth of Massachusetts had already enacted programs with similar objectives.

Recent thought has been focused on means "to help the person to help himself and to restore him to a position of self-support and self-respect."⁴⁸ How this goal can be achieved within the framework of current economic trends has become a major issue for rural Massachusetts. The controversy is not one of individual efforts versus public action but rather over the choice of policies most likely to achieve the common objective. On this point diversity has marked the thinking of every town. One section of the population places exclusive blame for poverty on the individual in want, firmly believes that the granting of assistance to the needy causes further dependency and that the most effective technique of rehabilitation is through discouraging requests for aid by reducing the status of relief recipients. This theory of deterrence, it is said, explains the comparatively low relief rates of earlier years. By the same token it is taken for granted that present employment opportunities are ample if diligently explored.

Another equally convinced group holds that society is responsible for personal dependency, and maintains that emergency relief should be granted with the avowed purpose of preserving the morale of those in want. This attitude is based on the belief that the economic crisis will soon pass and every worker will

⁴⁵ J. J. Spengler, "Has the Native Population of New England Been Dying Out?" *Quarterly Journal of Economics*, 44:639-662 (August 1930).

⁴⁶ See case studies in Eugene E. Oakes, *Studies in Massachusetts Town Finance* (Harvard Economic Studies 57, Cambridge, 1937).

⁴⁷ Kelso, *History of Public Poor Relief in Massachusetts*, 121. See also Royal S. Van de Woestyne, *State Control of Local Finance in Massachusetts* (Harvard Economic Studies 49, Cambridge, 1935).

⁴⁸ Massachusetts Department of Public Welfare, *Annual Report*, Nov. 30, 1927, p. 56.

have adequate employment. The return of prosperity to the Nation, it is hoped, will mean the end of insecurities for rural Massachusetts.

Between these two polarities is the preponderance of opinion. Neither of the two viewpoints seems entirely acceptable, but a satisfactory combination is difficult. The amorphous nature of this orientation is evidenced by the reactions to each successive catastrophe and the meliorative measures they call forth. Each event is viewed as unique, and there is little comprehension of the changes underway. Emergency programs are accepted with mingled feelings and half-hearted support. There is agreement that new protections are needed to prevent recurrent crises, but their nature is a question in heated dispute. The forthcoming years may witness the emergence of a concept of security in tune with the present economic order. When this takes place, the support of new public measures to facilitate the ends sought may be anticipated.

CROP HUSBANDRY IN EIGHTEENTH CENTURY ENGLAND

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Part 2

GLOUCESTER, HEREFORD, AND WORCESTER

If only by reason of their prolific orchards and their common consumption of cider, the three counties of Gloucester, Hereford, and Worcester may be grouped together. The first was divided into three parts by most of the topographers: the Cotswolds, mostly devoted to sheep, but growing some corn; the Vale of Gloucester which produced corn, cattle, cheese, and fruit; and the Forest of Dean which contained about 30,000 acres of woodland and some mines.

The farming of Gloucester, though a little improved in the enclosures, was sufficiently poor at the end of the eighteenth century to justify the statement that it had not changed greatly during the previous hundred years,⁸² and the earliest references to its processes concern themselves with the practice of paring and burning. This was done on the heathland both in Gloucester and Worcester, peas being grown on the newly broken land, which was thereafter laid in ridges for wheat. Other "old sward" presumably in wettish parts of the county fetched so high a rent as £3 an acre when used for growing rape after paring and burning.⁸³ At Lechlade, in 1736, the light gravels were plowed only once and the grain harrowed in.⁸⁴ Young was very unfavorably impressed by the culture in the east of the county. The farms were very large, ranging from 800 to 2,000 acres, but the crops were poor, and the one-wheel plows were drawn by four horses at length. At Stow there was improved culture, but he saw eight oxen drawing a clumsy plow only 3 inches deep. From Crickly Hill to the Vale of the Cheltenham the same conditions applied, although the vale farms were smaller. Here sainfoin was common, and the hill pastures were sometimes pared and burnt for wheat. Oxen were used for plowing, as they were on the enclosures between Gloucester and Newnham, where a seven-course rotation was practiced and the meadows were good. The yields of grain even here were lower than the average of the country at large.⁸⁵ The land throughout the "fertile" Vale of Evesham was thrown up in ridges 10 to 30 yards wide and at least 3 feet high in the middle. The headlands, which were thrown up in the same manner, dammed in the water which was said to have been often seen 3 yards wide in the furrows. The system was condemned as the worst possible method of draining, or better, of not draining the land.⁸⁶ Grass seeds, turnips, and clover had been introduced in the Cotswolds early in the century by an enterprising farmer named Richard Bishop, and by 1783 these

⁸² Ernle, *English Farming, Past and Present*, 230-231.

⁸³ Richard Bradley, *A General Treatise of Husbandry and Gardening*, 45 (1726); Ellis, *Modern Husbandman*, 3 (July): 34.

⁸⁴ Ellis, *New Experiments in Husbandry*, 5.

⁸⁵ Young, *Six Weeks Tour*, 102-114.

⁸⁶ Nathaniel Kent, *Hints to Gentlemen of Landed Property*, 17 (1775).

improvements enabled double the former number of livestock to be kept. This land was most likely under the alternate husbandry, and was not really well tilled.⁸⁷ On the edge of the Cotswolds at Sherburn a large enclosure was being made in 1776, and had then been in progress for three or four years, the dry stone walls of the district costing 1s. 6d. for 5½ yards, 4½ feet high. In 1786, the country between Cirencester and Lechlade was all enclosed and under a five-course rotation which dispensed with the fallow. At the opposite end of the county from the Dean to Gloucester were the orchards.⁸⁸ Marshall visited Gloucester twice at about this time, and reported the same farming. In the Vale of Evesham and Gloucester the farms of mixed arable and grass were of 100 to 300 acres in size. Five horses were used in a plow. One course was fallow, barley, beans or clover, wheat. The every year's land near Gloucester grew pulse or corn alternately. The ridges were, he said, 4 feet deep and were a common feature of the open-field husbandry. The system increased the acreage when the land was laid down to grass; the same argument was made again in 1928, not far from Banbury. The bean and pea stubble was sometimes breastplowed previous to sowing wheat. This same was a novelty to Marshall as he had only seen a breastplow used for paring. It is indeed one of the very few references to the use of this implement for cultivation, although it is still occasionally used in Gloucester for preparing the ground for potatoes. Some of the meadows were dressed with ashes, but their drainage was deficient and very little manuring was done. On the Cotswolds nearly all the land was then enclosed, the sheep walk and cow down having been turned into arable land by means of the improvements resulting from the granting of leases. The rotation here was lengthy: turnips, barley, grasses, wheat, oats, peas, etc. Sainfoin was general and the old turf had been broken up during the enclosure by sod burning. The produce of the Vale of Berkeley was principally grass.⁸⁹

All this is confirmed by the county reports, the first of which added that wheat had only been grown on the light lands for the past eighty years.⁹⁰ These lands formerly had been devoted to rye, but lime had made wheat possible. By 1807, it was estimated that there were 300,000 acres of tillage in the county, but badly managed. Potatoes were grown to some extent on every farm. Tares were grown for eating off by sheep. The flax formerly grown in the Vale had almost gone out of cultivation; some meadows in the Vale were watered. Wagons, carts, and drays were all used for transport. The old one-wheel plow was used in the Cotswolds, but a double-furrow plow with two wheels was gaining notice, and in the lower grounds a then modern implement known as the Beverston plow had become fashionable. In the Vale, the old swing plow remained the favorite; drills were in use but were not very common; and there were a few threshing machines. The old wooden roller was slowly being displaced by one of cast iron, and an apparatus for mole draining was, at all events, available, if not extensively used.⁹¹

Lemster bread and Weobley ale were among the famous products of Hereford, and were well known for their quality before the opening of the eighteenth century. The fine wool of the county was known as Lemster ore, and the cider was equally esteemed, while the

⁸⁷ Simeon Moreau, *A Tour to Cheltenham Spa*, 61 (Bath, 1783); *Annals of Agriculture*, 6:131-133 (1786).

⁸⁸ *Annals of Agriculture*, 6:136; 8:54-55 (1787).

⁸⁹ William Marshall, *The Rural Economy of Gloucestershire* (Gloucester, 1789).

⁹⁰ George Turner, *General View of the Agriculture of the County of Gloucester*, 11-48 (1794).

⁹¹ Thomas Rudge, *General View of the Agriculture of the County of Gloucester*, 81-86, 101-154, 165, 202, 255, 259-261, 264, 266, 267, 270-271, 275 (1807).

bacon from hogs fed on the windfalls in the orchards was in demand in London. The county was well cultivated, but it is probable that the products and methods changed little during the century. The practice of burning the moss, mixing the ashes with lime, and plowing for rye, thus obtaining a great increase, after which a crop or two was taken and the land let go back to grass, was known in Mortimer's day.⁹² Marshall recorded the county as enclosed, and described the same crops and stock, although Ernle emphasized the number of open-field farms.⁹³ Composts were made of the scourings of hills and roads and the dripping of yards, with good effect upon the land.⁹⁴ John Clark also reported a variety of courses and discussed the turnip crop, while Young stated that Hereford, viewed from the Malvern Hills in the spring, seemed a woodland whitened by innumerable orchard blossoms.⁹⁵ The courses at the end of the century had become fallow on clover ley, wheat, peas and beans, wheat, barley, and clover. As much as 120 bushels of lime was sometimes put on an acre of clover ley in heavy lands. The Ryelands had been made productive of wheat by liming, the course being barley and seeds, then fallow for wheat. Oats were grown on the borders of Wales and in some parts of the east of the county. Hops were most prevalent near Worcester. Rye was grown sparingly although formerly it had been very general in the light lands, and potatoes were gaining ground each year.⁹⁶ The farms were, in general, pretty extensive, with annual rents of £400 to £500, but there were small ones with rents ranging between £50 and £100. During the wars, however, the practice of consolidating had reduced considerably the number of small farms, and leases, formerly of twenty-one years, had been made terminable at seven or fourteen.⁹⁷ The implements used in 1805 were much the same as they had always been. There was a light Lammas plow, without a wheel, drawn by three or four horses. The double plow had rarely been tried, and drill plows had received little attention. Only one threshing machine was mentioned, but both wagons and carts were used for transport.⁹⁸

The fruit trees in the hedgerows of Worcester impressed Defoe,⁹⁹ but the county was a mixture of good and bad husbandry. Clover was introduced by its advocate, Andrew Yarranton, in the seventeenth century, but the open fields and wastes were adversely commented upon by the reporters for the Board of Agriculture at the end of the eighteenth century.¹⁰⁰ The breastplow was in use for breaking up heath land in 1726, as it was in other counties, and Bradley recorded the use of coal ashes on the clays, the process being to burn the small coal from the waste heaps at the pit heads with furze and earth, and to mix it thoroughly with the soil, which then produced heavy crops.¹⁰¹ Flooding near the

⁹² Mortimer, *Whole Art of Husbandry*, 58.

⁹³ Marshall, *Rural Economy of Gloucestershire*, 2:224-225; Ernle, *English Farming, Past and Present*, 228.

⁹⁴ Kent, *Hints to Gentlemen*, 55; John Clark, *General View of the Agriculture of the County of Hereford*, 23 (1794).

⁹⁵ Clark, *General View . . . of Hereford*, 15-20; *Annals of Agriculture*, 6: 122, 125 (1786).

⁹⁶ John Duncumb, *General View of the Agriculture of the County of Hereford*, 51, 56-58, 65, 66, 103 (1805).

⁹⁷ Clark, *General View . . . of Hereford*, 14; Duncumb, *General View . . . of Hereford*, 33, 41.

⁹⁸ Duncumb, *General View . . . of Hereford*, 45, 47.

⁹⁹ Defoe, *Tour*, 2:331.

¹⁰⁰ Ernle, *English Farming, Past and Present*, 229.

¹⁰¹ Bradley, *General Treatise of Husbandry and Gardening*, 45, 194. Cf. Hale, *Compleat Body of Husbandry*, 87-88.

river was also made use of in the county.¹⁰² By 1785, carrots and cabbages had been cultivated as forage by one improver, who had also used a drill. From Chipping Norton to Broadway the hills were poor, and the vale was ridged up in the customary high lands, on which there was a larger proportion of fallow in 1785 than Young had previously seen.¹⁰³ At the end of the century, rye was only grown to be grazed by sheep, the crops being chiefly wheat and barley. The county was then generally enclosed, and there was no particular rotation except in the open fields. Farmyard manure, lime, and waste products were all used, and on the light lands near Kidderminster paring and burning was common; both single and double plows were used in this district, and the Norfolk course had been adopted on the best lands. The clover was left down for one or more years as the farmer judged good. The drill husbandry had been adopted on the hills and lighter soils, but barley was the crop chiefly cultivated by this new method. More beans than peas were grown, and vetches were also popular. Potatoes had been adopted and were grown in great plenty. Clover was "considerable" although sainfoin and lucerne were not seen by the writer of the second report. Apart from this the crops and farming of the county was as it had been.¹⁰⁴

SALOP, STAFFORD, WARWICK, AND CHESHIRE

The group of four counties, Salop, Stafford, Warwick, and Cheshire, lying between the east midland group and Wales, are all that remain to be described. Of these there is the most continuous information with regard to Stafford.

Robert Plot gave a well-rounded picture of conditions in this county in 1686. In the moorlands and near the rivers the land was devoted to grazing, dairy farming, and sheep. Even then, there had been improvements by marl, lime, etc., so that wheat and rye were cultivated, as they were in the south, although some of the land was so light that it would only produce oats and barley. The proportion of arable was not so great in the north as in the south. The common three-course rotation, including fallow, was used on the clay common fields and also on the "light or hazel" ground if in open field. On the sandy, gravelly ground only rye, buckwheat, or oats for three years, if well dunged, were grown, followed by a fallow which must certainly have been necessary. Some of the heath was enclosed for arable temporarily, being used in the method known as the alternate or convertible husbandry. The land was broken up with mattocks, limed, plowed, and sown with rye, winter fallowed, barley sown in April, followed by oats for two years, and then thrown open to common again. Marl was used at the rate of 200 to 400 loads an acre, and dung, lime, and mold mixed together for the arable, while at Harbourn vetches were plowed in for green manure ("the oddest sort of manure I ever met with," said Plot).¹⁰⁵ The system of alternate husbandry continued throughout the century, the breastplow being used for paring, although in the second edition of his report, Pitt said that paring and burning had not been much used in the county.¹⁰⁶ It was not considered proper to

¹⁰² Hale, *Compleat Body of Husbandry*, 62.

¹⁰³ *Annals of Agriculture*, 4:98 (1785); 6:120 (1786).

¹⁰⁴ William Thomas Pomeroy, *General View of the Agriculture of the County of Worcester*, 12-15, 45-57 (1794); *Annals of Agriculture*, 23:447 (1795); William Pitt, *General View of the Agriculture of the County of Worcester*, 63-112, 195, 196, 198 (1813).

¹⁰⁵ Robert Plot, *The Natural History of Staffordshire*, 107-108, 340 ff., 345 (Oxford, 1686).

¹⁰⁶ Mortimer, *Whole Art of Husbandry*, 60-66; Switzer, *Ichnographia Rustica*, 3:214; John Laurence, *A New System of Agriculture*, 45, 83 (1726); Simpson, *The Agreeable Historian*,

burn the lighter clay, but better to manure it with lime, dung, or sand.¹⁰⁷ Marl was used extensively on the sands. A great deal of attention was given to complete cultivation, and, presumably on enclosed lands, a long rotation of wheat, barley, peas, wheat, barley, and red oats was known in 1707, while the barley was then reputed not only to make good malt, but also good bread, the red oats being used for oatmeal.¹⁰⁸ The limited knowledge of the practice of adjoining counties in those times is exemplified in a letter received by Ellis from a gentleman in Cheshire, who said that Cheshire and Lancashire would not sow clover, although Stafford and Warwick did, while the two former counties used marl and the two latter were too indolent.¹⁰⁹ It is nevertheless quite clear that marl had certainly been used, not only in Stafford, but also in Salop and Warwick for some time, especially on the enclosures, and lime was used on the grassland.¹¹⁰ During the twenty years prior to 1785, the farming of the county settled down into a system slightly different. The Norfolk course was adopted on the light lands, and on the heavy the old open-field system of fallow, wheat, and spring corn had been amended by adding seeds to the latter and a ley for two or three years. Some hemp and flax were also cultivated. Rye for human food had given place to pure wheat, although formerly it had been sown with that grain on the light lands. The system of wheat on clover ley had displaced rye, and where cultivated it was used for sheep feed. Potatoes were also generally grown, and drill husbandry, although by no means the usual method, had been introduced. Some cabbages were grown in 1808, and the very effective manures had not been changed, although the increasing size of the towns allowed their refuse to be added.¹¹¹

At the end of the century, there were still extensive wastes in Stafford, but not 1,000 acres of open field. Needwood Forest occupied 10,000 acres, Cannock Heath 25,600 acres, and Sutton Coldfield with other local wastes another 10,000 acres. In all, however, this amounted to less than 50,000 acres, and there were 600,000 acres of cultivated land. Pitt estimated, indeed, that there were still 100,000 acres of reclaimable land in 1794.¹¹² The size of farms varied widely, some being 20 acres, and others 500 acres; Pitt said that there had been some consolidation of small farms within the past twenty or thirty years.¹¹³ Besides improved rotations other advances had been made in the county. A plow with an iron earthboard fastened to the colter was used as well as the usual single wheel and foot plow and a double furrow plow with four horses was reckoned to be able to do 2 acres a day. Covered drains were general, and the use of the drill plow has been mentioned already. The harrows were ordinary, but both the ordinary and spiked roller were in use, and both wagons and carts were used for transportation.¹¹⁴

3: 913-914 (1746); Mordant, *Complete Steward*, 141; *Description of England and Wales*, 8: 193, 201-202 (1769); William Pitt, *General View of the Agriculture of the County of Stafford*, 165 (ed. 2, 1808).

¹⁰⁷ Bradley, *Complete Body of Husbandry*, 57-100.

¹⁰⁸ Mortimer, *Whole Art of Husbandry*, 43-48, 66-68.

¹⁰⁹ Ellis, *Modern Husbandman*, 3 (July):138.

¹¹⁰ Hale, *Compleat Body of Husbandry*, 11-13, 44, 87; Mills, *New and Complete System*.

¹¹¹ *Annals of Agriculture*, 4:477-481 (1785); William Pitt, *General View of the Agriculture of the County of Stafford*, 75-92 (1794), and the 1808 edition, p. 58-69, 73, 166-167. Cf. Arthur Young, *A Six Months Tour through the North of England*, 3:252-272 (ed. 2, 1771).

¹¹² *Annals of Agriculture*, 27: 462, 484-487 (1796); Pitt, *General View . . . of Stafford*, 22 (1794); Ernle, *English Farming, Past and Present*, 227.

¹¹³ Pitt, *General View . . . of Stafford*, 29 (1808).

¹¹⁴ *Annals of Agriculture*, 27:471, 487 (1796); Pitt, *General View . . . of Stafford*, 47-48 (1808).

During the seventeenth and eighteenth centuries, the forests of the northern part of Warwick had been partially destroyed by being used as fuel for ironworks, and the land was steadily being reclaimed for arable, while the open-field arable of the south and east was being enclosed for pasture, although some arable was cultivated there.¹¹⁵ The use of marl was as well understood in this county as anywhere else in the country, with the exception of Kent and Sussex.¹¹⁶ In the light lands a two-wheel plow light enough to be drawn by two horses was used, although the drag plow without either wheel or foot was also common.¹¹⁷ The farmers of Warwick seem to have been open to improvements, because by 1777 they were beginning to become sensible of the propriety of hoeing turnips, although it was not yet done thoroughly.¹¹⁸ Young only crossed a corner of the county in 1770, but recorded long courses, including clover and turnips, on the small farms near Aston. Potatoes were also grown, lime was used, and hollow drains were cut. He went via Hagley to Bromsgrove and Worcester, and found much the same courses, dairies, few sheep, double plows, and watered meadows where these were practicable.¹¹⁹ In 1785, he said that the road between Birmingham and West Bromwich was one continued village of nailers, while in traveling from Wolverhampton to Birmingham he did not see a single farmhouse. There were, however, dairies near Coventry. Between Banbury in Oxford and Stratford-on-Avon, both the open-field and the enclosed land was in high ridges (as much of it is today), and the rotation was fallow, wheat, and beans. There was a good deal of dairying and sheep farming here, but only one field of turnips in the district. Near Atherston, however, there was the best drilled farm in the country. South to Henley in Arden, the whole country was enclosed and the same to Birmingham, although not such good land. In the latter part lime was used in the fallow for wheat.¹²⁰ By the date of the first report, Elkington's system of drainage had been practiced for many years, the drill husbandry by some few people, and only a few ox teams were used.¹²¹ Though there could be said to be no general course of crops in the county, some developments had taken place. Rye was seldom sown at the end of the century except for sheep feed, although barley and oats were very common. Gray peas, beans, and tares were cultivated and turnips had extended very rapidly. Cabbages were still principally confined to gardens, but potatoes were generally grown. Lime, marl, and waste products from the towns continued to be used for manure. The plows also had become more diversified. In addition to the double and single plows and the large swing plow in general use on the borders of Worcester, the improved Rotherham plow with wheels and some of Small's plows had been introduced. The harrows were the same as elsewhere, but oak rollers of both the light and heavy types were used, and wheat drills were common in every part of the county; small threshing machines had been set up in different parts, although winnowing machines were not general. There were also four-horse wagons and turn-up carts for two or three horses.¹²²

¹¹⁵ See the topographers. Cf. G. E. Fussell, "Agriculture and Economic Geography in the Eighteenth Century," *Geographical Journal*, 74:170-178 (August 1929).

¹¹⁶ Hale, *Complete Body of Husbandry*, 44.

¹¹⁷ Mordant, *Complete Steward*, 275.

¹¹⁸ William Bray, *Sketch of a Tour into Derbyshire and Yorkshire*, 56 (ed. 2, 1783).

¹¹⁹ Young, *Six Months Tour through the North of England*, 3:273-305.

¹²⁰ *Annals of Agriculture*, 4:156-158 (1785); 16:525-530 (1791).

¹²¹ John Wedge, *General View of the Agriculture of the County of Warwick*, 18, 25, 42 (1794).

¹²² Adam Murray, *General View of the Agriculture of the County of Warwick*, 56-61, 74, 87, 94, 97, 100, 102, 105, 107, 114, 119, 135, 145 (1813).

There is a similar dearth of information about the county of Salop in the early part of the century. All that the topographers said is that the county was fertile, abounding in wheat and barley in the north and east, and devoted to pasturage in the south and west, while the coal and iron industries and the abundance of wood was also noted. The use of lime for grassland was understood early, and it was composted with dung at the rate of 20 bushels to 20 loads, this quantity being applied to an acre.¹²³ The rotations did not, however, meet with Young's approval in 1785, although clover ley was included and potatoes were grown at every house, while the cottagers grew hemp from which they wove their linen. No sheep were then folded although lime continued to be used. Oxen were used for plowing, but the district of Shifnal was "uncommonly full of manufactures." Wheat or monker (maslin) was grown here, and there were many dairies between this town and Shrewsbury. In the neighborhood of Coalbrookdale, however, horses were used for plowing.¹²⁴ According to the 1794 report on the county, the common field was mostly enclosed, but the tillage was badly cultivated,¹²⁵ and this was amplified in 1803. Then the course pursued was wheat, barley, turnips, barley, and clover, or variations of this. Little rye was then grown, although it had formerly prevailed on the light lands, which had, however, been made fit for wheat by liming. Turnips were grown regularly in the east of the county, and a little paring and burning was done, although this seems to have been most negligible. Farmyard manure and lime complete the list of fertilizers. Several of the new threshing machines also had been introduced.¹²⁶

Cheshire was always famous for its dairy industry, and Defoe in 1724 estimated its production at well over 22,000 tons of cheese per year.¹²⁷ The county was, in Celia Fiennes' time, "much in inclosures."¹²⁸ The chief feature of its agriculture that impressed the didactic writers was, however, the practice of marling. This was very heavily done, so much as a hundred loads an acre being laid on the land, the good effect of which was reckoned to last from twenty to thirty years. It was, indeed, said to make a new soil.¹²⁹ When Young first visited the county in 1770, he found a three or four-course rotation, including wheat, barley, and oats or clover, some turnips, and a good many potatoes, marl and lime being used for manure.¹³⁰ There was, however, a comparatively small area of tillage in the county. In 1795, Aikin estimated that three-quarters of the area was pastured or mown, only one-fourth being plowed, the course on heavy clays being four years crops, i.e., oats, fallow, wheat, and oats, and then laid down with clover and grass seeds and pastured for five or six years before being broken up again. Green crops as winter food for cattle were seldom grown, but in the north of the county a good deal of attention was given to potatoes and carrots for the markets provided by the manu-

¹²³ Lisle, *Observations in Husbandry*, 31. Cf. Arthur Young, *Political Essays*, 129 (1772).

¹²⁴ *Annals of Agriculture*, 4:171-173, 343-344 (1785).

¹²⁵ J. Bishton, *General View of the Agriculture of the County of Salop*, 8 (Brentford, 1794).

¹²⁶ Joseph Plymley, *General View of the Agriculture of Shropshire*, 141, 169, 173, 231, 232 (1803).

¹²⁷ Defoe, *Tour*, 2:394. See also ed. 5, 2:338.

¹²⁸ Celia Fiennes, *Through England on a Side Saddle in the Time of William and Mary; Being the Diary of Celia Fiennes*, with an introduction by Hon. Mrs. Griffiths, 147 (1888).

¹²⁹ Ellis, *Modern Husbandman*, 2 (May):66; North, *Account of the Different Kinds of Grasses Propagated in England*, 23; Mills, *New and Complete System*, 1:36-38; Hale, *Complete Body*, 47.

¹³⁰ Young, *Six Months Tour through the North of England*, 3:242-249.

facturing districts of Lancashire. The sandy land was plowed only for three years and then went back to grass, although it sometimes bore a crop a year.¹³¹

By the date of the second edition of the county report on Cheshire, some changes had taken place. Tillage, although still proportionately less than in other counties, was increasing. Oats were, however, of more importance to the arable farmers of the county than wheat. The fallow was still pretty general. There was a diversity of courses, and only a little barley and some turnips were grown. Potatoes here, as in Lancashire, were more general than in other counties, and were sometimes sown on the fallow. Turnips and cabbages for winter feed had become common in the middle and south of the county, beans not being common. Paring and burning had almost been given up, but marl and lime continued to be regularly used in addition to the usual farmyard manure. Drilling was, however, of trifling extent. The Rotherham plow had become the most common in the county by this date, but some double-furrow wheel plows were used, and the mole plow for draining the pastures had been introduced. The harrows were ordinary, but the spiky roller and rollers "with knives" for cutting tough fallow were used, some being made of iron, but most of wood weighted with stones. There were some drills in use and the number of threshing machines was increasing. Transport was effected with both wagons and carts.¹³²

WALES

The principality of Wales may perhaps be dealt with as a whole. Even today over three-fifths of its area is devoted to grazing, 1,600,000 acres being what are known as "Rough Grazings" and over 1,500,000 acres being "Permanent Grass not kept up for hay."¹³³ The area of cultivation in proportion to the pasture must have been even less in the eighteenth century, and the area devoted to tillage, except in specially favored places, was given over to the poorer cereals while the farmers were often too poor to go in for improvements. Both rye and the naked oat, the latter because it threshed clean and made good oatmeal, were common crops in the northern counties and in Wales in 1767. The former was sometimes grown with wheat and called spelt or maslin, but the practice was condemned as bad or only possible where the people were accustomed to eating rye bread, which was partly the diet of these districts.¹³⁴

One of the favored districts was a part of the county of Flint where a good deal of wheat was grown in 1773, while potatoes were grown in every cottage garden, although they were unknown in the county at the beginning of the century. The Vale of Clwyd, which met with great commendation from most of the tourists who passed through it, was also said to be of matchless fertility. Limestone was burnt in one or two places in North Wales, the produce being used for manure or exported to neighboring counties for that purposes. Anglesey, although it was known as the granary of Wales, did not impress the travelers favorably, but in spite of its unprepossessing appearance it is said that

¹³¹ John Aitkin, *A Description of the Country . . . round Manchester*, 44, 46 (1795). See also *The Traveller's Companion from Holyhead to London*, 95, 96, 100, 105 (1793); Thomas Wedge, *General View of the Agriculture of the County Palatine of Chester*, 16-22 (1794).

¹³² Henry Holland, *General View of the Agriculture of Cheshire*, 114-116, 125-128, 129 ff., 139, 156, 162, 216, 221, 226-229 (1808).

¹³³ Stanley M. Bligh and F. J. Prewett, "The Improvement of Upland Grazings," in University of Oxford Agricultural Economics Research Institute, *Progress in English Farming Systems*, 2:5 (Oxford, 1930).

¹³⁴ Mills, *New and Complete System*, 1:370.

90,000 bushels of barley, rye, and oats were exported in 1770.¹³⁵ In Montgomery, which received some of the lime burnt in the kilns mentioned above, there were some corn-fields among the pastures, and in the Vale of Rhydiol, Aitkin found in 1796 that lately much ground had been broken up for potatoes which flourished exceedingly.¹³⁶

The county reports do not add very much to this scanty information about what must have been a very meagre farming practice. Such land as was devoted to tillage in Anglesey bore oats and barley for a number of years, very little wheat being cultivated, and such manures as were used were applied to the barley crop. Potatoes were not so common as the reporter to the Board of Agriculture considered they should be; clover had been tried, and a few fields of turnips had been cultivated of late years. The manure was lime and shell sand, very little farmyard manure being made, and the proportion of tillage was small. Carnarvon was exactly the same. Tillage hardly existed in Denbigh. In Flintshire, however, things were different. Clay marl was applied to the grass. In the middle of the eighteenth century, rye was more generally cultivated than either wheat or barley, but it had fallen totally into disuse, the preference being given to wheat, although oats after oats was a common practice. Lime was the chief manure in Merioneth, but there was very little cultivation in the county, oats being the main crop. Little barley, less wheat, and few turnips were grown, while, here again, there were less potatoes than there should have been. Montgomery distinguished itself by its conservatism in sticking to the medieval crop, maslin, a mixture of rye and wheat in the proportions of one to three, but in this country the universal lime was supplemented by dung.¹³⁷

The small area of cultivation in Merioneth had aroused enthusiasm in Defoe some seventy years before. He spoke of the fields of that county and Carnarvon as "shining with Corn." In the former county and indeed throughout Wales he found provisions cheap, and this fact is repeated by his later editor. Further south, Glamorgan was known to him as the Garden of Wales.¹³⁸ There is, however, no further information on this district between the date of his writings and 1768 when Young visited it on his first farming tour. Young was not impressed with the farming, and one could hardly expect him to be. Half way between Chepstow and Newport he found the alternate husbandry with very small resulting yields, and grass was very much preferred to arable, while lime was the great manure. Near Newport the rotation was fallow, wheat, barley, and clover for two years, then wheat again, and but little grass; the general practice was to use six oxen on a plow with which draught barely an acre a day was plowed. Further west between Cowbridge and Bridgend he found the worst farming he had yet seen. There was no folding of sheep and no turnips on the light land, but carrots and potatoes were grown. At Bridgend the land was heavily limed and a rotation of wheat, barley, oats, oats, and fallow was followed. Some, but very few, of the farmers included clover.¹³⁹

¹³⁵ Thomas Pennant, *A Tour in Wales*, 1:2-3, 15-16; 2:240, 381 (1784); J. Hucks, *A Pedestrian Tour through North Wales in a Series of Letters*, 84 (1795); *The Traveller's Companion from Holyhead to London*, 6, 10; Rev. Richard Warner, *A Second Walk through Wales . . . in August and September, 1798*, p. 281 (Bath, 1799); W. Hutton, *Remarks upon North Wales*, 75 (Birmingham, 1803).

¹³⁶ Arthur Aikin, *Journal of a Tour through North Wales and Part of Shropshire*, 6, 38 (1797).

¹³⁷ In George Kay, *General View of the Agriculture of North Wales* (Edinburgh, 1794), see Anglesey, p. 12-17; Caernarvonshire, p. 11; Denbighshire, p. 13; Flintshire, p. 10; Merionethshire, p. 12; and Montgomeryshire, p. 15, 17.

¹³⁸ Defoe, *Tour*, 2:363, 384, 388. See also ed. 5, 2:333.

¹³⁹ Young, *Six Weeks Tour*, 114-117.

Young again passed through Wales in 1776 and found the alternate husbandry in the Pembroke mountain, the course being grass plowed up for fallow and lime, wheat, peas or barley, barley or oats, oats and then grass for five or seven years. Some few of the farmers sowed clover. The farms were small and the whole county was enclosed. In Carmarthen at Llandilo he found an adaptation of the Norfolk course, but in general the rotation was wheat, barley twice, oats twice, clover, and three years water meadows. The mountains between there and Llandovery were cultivated to their very tops; from Trecastle to Brecon lime was the familiar manure. At Crickhowell there were watered meadows and the lands were let high owing to the proximity of the mines. Beans were not cultivated, but a general improvement of the county was evident because a great corn market was usual at Brecon, whereas twenty years before scarcely any wheat was sold there. From Brecon to Monmouth there was poor cultivation, but the Forest of Dean was a great bean country and the usual rotation was wheat, beans, barley, and beans, the latter being set by hand.¹⁴⁰ Though Pembroke was enclosed, it is not clear that the enclosures were always adequately fenced. Although fences of stone and earth and scanty hedgerows were seen, it was necessary to stake out the animals when they grazed, somewhat as is done in certain of the mountain farms of Southern Germany today. In consequence the traveler was often impeded by the trailing ropes. Indeed, the country was not very prolific,¹⁴¹ and the reporter stated that it was not a corn country, the mixed or alternate husbandry being general, but with no systematic rotation. Some red clover and rye grass were grown, and there were a few turnips.¹⁴² There was, however, an area of market gardening between Fishguard and St. Davids, known as the Battersea of Wales, which supplied the former with vegetables.¹⁴³ Lime seems to have been widely used throughout South Wales; it was spoken of as the general manure in Monmouth and Glamorgan, being laid on at the great rate of 400 to 500 bushels an acre in the latter county. Here the best farmers were said to grow wheat, barley, clover, and to repeat this until the land was exhausted. Indeed, land of a high rental, that is 30 to 40s. an acre, was badly farmed, poorly manured, and lime was used indiscriminately on all kinds of soils, in spite of the fact that the Vale of Glamorgan had been known as the Garden of Wales for a hundred years. The reporter added that, although clover, trefoil, rye grass, and sainfoin had been introduced, they were not common, the rotations were very diverse, fallow little practiced, beans, peas, and vetches general. There was a large area of waste in the county. The plows were said to be too heavy for the soil and were drawn by oxen. The coast used sea sand and sea sludge for manure like other counties in a similar situation. In some parts of Carmarthen, Kentish and Norfolk plows were used, with two horses in light and four in heavy land, but throughout the counties on the south coast of the bay, it was said that the plows were too light and the draught was also sometimes two horses and two oxen. However, only the alternate husbandry, including barley and oats, was very general. The carts here were condemned as small, ill-built and having badly fitting wheels, and the manure was wasted in compost although the universal lime

¹⁴⁰ *Annals of Agriculture*, 8:31-54 (1787).

¹⁴¹ H. P. Wyndham, *A Gentleman's Tour through Monmouthshire and Wales*, 88 (1775); James Baker, *A Picturesque Guide through Wales and the Marches*, 1:144, 175 (ed. 2, Worcester, 1795); Rev. J. Evans, *Letters Written during a Tour through South Wales*, 307 (1804).

¹⁴² Charles Hassell, *General View of the Agriculture of the County of Pembroke*, 10-18, 40 (1794).

¹⁴³ Richard Fenton, *A Historical Tour Through Pembrokeshire*, 15 (1811).

was fetched from 20 to 40 miles.¹⁴⁴ Few of the new crops had been introduced by the end of the century. Turnips were only to be found here and there, but many potatoes were grown. Probably the wheat area was increasing, but the preponderant grains were barley, oats, and rye, the latter being still sown with wheat near Aberystwyth. Difficult as it was for improvements to spread in England, it was obviously more difficult for them to make their way into the then inaccessible and poverty-stricken mountain lands.¹⁴⁵

LANCASHIRE

In Lancashire the three-field system was prevalent over large parts of the country in 1770. The alternate husbandry was also a usual method, and clover had been introduced into some rotations. The early introduction of potatoes into the county had, however, mitigated the condition of farming, and, indeed, it was naturally more a grass county than arable, except in the north. It was then in a somewhat backward condition.¹⁴⁶ The topographers were agreed upon a division of the county into indefinite areas of cultivation. The level grounds bore good crops of wheat and barley, the hilly parts were stony and barren except the bottoms where oats did very well, but the moors provided little beyond turf and submerged trees for fuel. Marling was customary in the early years of the century, and coal ashes were used for manure in damp soils.¹⁴⁷ So early as 1750, Ellis commented upon the large quantities of potatoes grown, and Lancashire could be said to be famous for this crop in 1767.¹⁴⁸ Oats were still the main cereal when the first report for the Board of Agriculture was written. They were the food of the laboring classes, especially in the north, and were often cultivated for three years in succession, followed sometimes by potatoes. Wheat was said to be coming in, but there were few turnips, although clover had become general. On the coast sea "slutch" was used for manure, marl and lime were also used, and an increasing supply of stable manure was obtained from the growing towns by the farmers who lived sufficiently near. Draining also was common, but the reporter for the county thought paring and burning were too much practiced. There was naturally an area of market gardens which supplied the vegetables required by such towns as Manchester.¹⁴⁹

No great change had taken place some twenty years later when the second report was written. The county was still not to be considered an arable district, although a good deal of grain was raised. The plowing was said to be generally well done and little fallow was practiced in the Ribble and Mersey district, although it was pretty common in other

¹⁴⁴ Wyndham, *Gentlemen's Tour*, 44; *Annals of Agriculture*, 17:39-40 (1792); Richard Warner, *A Second Tour through Wales*, 58 (1799); John Fox, *General View of the Agriculture of the County of Glamorgan*, 21, 25, 28-29, 34-35, 43 (London, 1796); Evans, *Letters Written during a Tour*, 105, 182, 189, 207, 231, 325, 416.

¹⁴⁵ John Clark, *General View of the Agriculture of the County of Brecknock*, 19, 23, 35 (1794); Thomas Lloyd and the Rev. Mr. Turner, *General View of the Agriculture of the County of Cardigan*, 10-11, 25-28 (1794); Charles Hassell, *General View of the Agriculture of the County of Carmarthen*, 13-15 (1794); John Clark, *General View of the Agriculture of the County of Radnor*, 13, 18-19 (1794).

¹⁴⁶ Louis W. Moffit, *England on the Eve of the Industrial Revolution*, 15, 16 (1925).

¹⁴⁷ Laurence, *New System of Agriculture*, 45; Hale, *Compleat Body*, 87.

¹⁴⁸ Ellis, *Modern Husbandman*, 1 (February):107-108.

¹⁴⁹ John Holt, *General View of the Agriculture of the County of Lancaster*, 24-43, 57-60 (1794). See also Aitkin, *Description of the Country round Manchester*, 16, 18, 204, 316; B. Faujas Saint-Fond, *Voyage en Angleterre*, 2:301 (Paris, 1797).

parts of the county. The Norfolk course or variants of it had been introduced into some of the southern parts. Rye as a bread corn was going out of fashion here as elsewhere, but was grown for spring feed. Less barley was grown than formerly, and oats which at one time exceeded the demand could no longer meet it. Few peas were grown, but beans on the heavy soils had long been common. Tares, turnips, and cabbages were seen in a few places, as was lucerne. Potatoes, of course, continued to flourish, but paring and burning had gone out of fashion. The manures were the same.¹⁵⁰ A good deal of reclamation work was done on the extensive mosses during the century, but sometimes a long period was needed before the land became productive.¹⁵¹ The majority of farms were small, and were occupied by the class known as domestic workers to whom their farming was largely a matter of providing their own subsistence, and in such conditions very little improvement could be hoped for.¹⁵²

WESTMORELAND, CUMBERLAND, NORTHUMBERLAND, AND DURHAM

In the agrarian polity of Westmoreland and Cumberland the outstanding feature was the large number of farms, many of which were owned by their occupiers. These people had all the sturdy virtues of their class, among which a desire to hand on tradition was prominent. A large proportion of the area was mountainous and uncultivated, and more grazing than arable was the order of the day. The topographers confined themselves to general remarks, and Young is the earliest authority for the farming of these counties. From Northumberland to Brampton the moors were uncultivated, but at High Ascot he found clover and potatoes, barley, and rye. Near Penrith on the larger farms turnips and clover as well as potatoes were cultivated, and lime was used at the rate of 90 bushels an acre on the arable. Between Penrith and Keswick there was a great deal of moor, but where cultivated, the land was under the five-course rotation including turnips, clover, and potatoes. At Shapp the alternate husbandry was common. The main crops were oats and barley and these formed the cereal foodstuff of the people. Probably even at that date wheat was grown in some of the range of "noble inclosures" lying south of the moors between Shapp and Kendalls.¹⁵³ It was a modern production in Cumberland when the first edition of the report on the county was written, having been introduced by Lord Muncaster some twenty years before at Ravenglass.¹⁵⁴ In the neighborhood of Carlisle the farming met with the approval of a foreign traveler in 1797. The plows, he said, were large and excellent for their work, and lime was burnt in many kilns not only for manuring the grassland, but also the arable.¹⁵⁵ Both editions of the report for this county were written by the same authors, and Andrew Pringle did both editions of the report for Westmoreland. In 1797 fallowing was still practiced in many parts of Cumberland, the course being fallow, wheat, oats or barley, and oats. This went for three or four rotations, and then the land went back to grass for from seven to nine years. Where turnips were grown the course was extended. Potatoes were grown by almost

¹⁵⁰ R. W. Dickson, *General View of the Agriculture of Lancashire*, 236-250, 290, 315-348, 360-366, 386-392, 483-502 (1815).

¹⁵¹ *Annals of Agriculture*, 3:89-91 (1785); 6:1-10 (1786); Aitkin, *Description*, 380-383.

¹⁵² Dickson, *General View . . . of Lancashire*, 90-117. See also George W. Daniels, *The Early English Cotton Industry*, 139-140 (1920).

¹⁵³ Young, *Six Months Tour*, 3:91-131.

¹⁵⁴ John Bailey and George Culley, *General View of the Agriculture of the County of Cumberland*, 23 (1794).

¹⁵⁵ Saint-Fond, *Voyage en Angleterre*, 2:299.

every farmer, either for the house or for sale. Dung was the chief manure, but both lime and sea refuse were used.¹⁵⁶ The farming of Westmoreland was of the same type, and Pringle added that only one quarter of its area was under crops.¹⁵⁷ In Cumberland about 470,000 acres were enclosed and cultivated, comprising almost half the area of the county. Of the remaining area, 361,000 acres were mountains, 9,000 acres were peat moss, and 160,000 acres were improveable common.¹⁵⁸ The plows used in these counties were swing plows "as used in all the northern counties." In Cumberland there were single horse carts, but in Westmoreland they were of various descriptions and sizes. In the former county some double moldboard plows were used for ridging up the turnips and potatoes, but there were no drills, threshing machines, or horse hoes. However, there were a few drills in Westmoreland, and winnowing machines were common in both.¹⁵⁹

The early topographers stated that Northumberland was, as Young found on his northern tour, wild and barren in the west. The earth, however, was fruitful, bearing very good wheat and most sorts of grain and with good meadows on the banks of the rivers. The main interest was in the coal and lead mines. In the northeast of Belford, whence came Cuthbert Clarke's draining plow at a later date, Defoe frequently saw a team of four oxen and two horses to a plow, "the Ground being so hard and stony as to require 10 or 12 cattle to plow with."¹⁶⁰ This no doubt accounts for Clarke's optimism in designing a draining plow which sometimes took as many as eighteen to twenty oxen to draw. Young thought that the large farms of the county were cultivated well, but the moors were cropped till the land was exhausted and then let down to grass, and there was much waste. Liming was practiced, some turnips were hoed, and the potato culture was carried out on a much larger scale than upon the smaller farms of Yorkshire and Durham, but Young found nothing too bad to say of the moorland alternate husbandry.¹⁶¹ At this time, however, some large tracts of the county were being reclaimed for arable, and split up into smaller farms.¹⁶² Ten years later an improved course had been adopted on those lands which were under the alternate husbandry. It was oats, potatoes, wheat or maslin, turnips, barley, potatoes, wheat, and then hay seeds and clover, harrowed in with a bush harrow.¹⁶³

Bailey and Culley wrote both editions of the county report on Northumberland and these were published in 1794 and 1797. Fallows had been given up except on land not fit for turnips, but the course of cropping was similar to that stated by Bailey in the *Annals*. Modifications had been introduced in order to suit the cropping to the type of soil. Rye, formerly the principal grain grown on light sandy soil, had given place to wheat since liming, turnips and artificial grasses had come in, except in very sandy soils, and potatoes of many varieties continued in favor. Oats were universal, but beans were

¹⁵⁶ Bailey and Culley, *General View . . . of Cumberland*, 188-206 (1797).

¹⁵⁷ Andrew Pringle, *General View of the Agriculture of the County of Westmoreland*, 18-30 (Edinburgh, 1794), and 1797 ed., p. 270-271.

¹⁵⁸ *Annals of Agriculture*, 21:446 (1793).

¹⁵⁹ Bailey and Culley, *General View . . . of Cumberland*, 183-184 (1797); Pringle, *General View . . . of Westmoreland*, 34-35.

¹⁶⁰ Defoe, *Tour*, 3:228 (ed. 5). Cf. *A Journey through Part of England and Scotland*, 24 (1746).

¹⁶¹ Young, *Six Months Tour*, 3:13-93.

¹⁶² William Hutchinson, *A View of Northumberland . . . Anno 1776*, 2:336, 450 (Newcastle, 1778).

¹⁶³ *Annals of Agriculture*, 5:361-362 (1786).

the prevailing crop on stony land. Turnips had then been grown in the county for forty years, and lime, marl, seaweed, and coal ashes, in addition to the universal dung, were used for manure.¹⁶⁴

Although the husbandry of the county seemed excellent to the Reverend Richard Warner, he deplored the power which the possession of very large farms put into the hands of a few people, and said that the yields were poor because of the soil and climate.¹⁶⁵ That a spirit of improvement was abroad there is no doubt, because Philip Hepburn wrote from London to Daniel Robson about a new kind of plow in order to provide himself with an excuse for inquiring into the course of affairs at Haytersbank,¹⁶⁶ and this fictional touch has certainly an air of verisimilitude. A swing plow on the lines of the Rotherham was in general use, but it varied widely in pattern because it was made by the local smiths. The double moldboard plow, the horse hoe, a drill for sowing turnips, brake harrows for rough lands, as well as lighter types and modern rollers were all used. Two-horse carts were common, but a one-horse type was being introduced. Wagons were also used and in the north of the county, threshing machines were becoming general by the end of the century.¹⁶⁷

Durham is also a mountainous county, and there is apparently little information about its farming in the early part of the eighteenth century. Even John Laurence, who lived at Bishops Weatmouth, was unable to find anything much to remark upon in his own county.

The use of lime in his day was a new idea, but Durham moors and waste grounds had been made arable by liming and enclosure.¹⁶⁸ According to the reporter for the Board of Agriculture, the common fields had been enclosed shortly after the Restoration.¹⁶⁹ Oats were largely cultivated in the county, the black oat being preferred as it made the best oatmeal.¹⁷⁰

Young also found little to say about Durham, confining himself to a long description of the Earl of Darlington's improvements at Raby on the borders of Yorkshire.¹⁷¹ In 1794, the course was fallow, wheat, oats, and beans or peas; some turnips and barley were grown in perpetual succession. Wheat was then grown on good land, but mesling (maslin) was still a usual crop. Paring and burning was an ancient practice on the land given up to the alternate husbandry. The fold yard and lime were the only manures.¹⁷² In the following year, a traveler was full of enthusiasm for the enclosures which occupied the 11 miles between Sedgfield and Durham, cultivated, in his eyes, "in the highest style." After leaving Durham for some miles along the Great North Road he crossed a large common then being enclosed.¹⁷³

John Bailey wrote the second edition of the county report and elaborated the information contained in the first. He estimated that 74,000 acres of a total of 114,071 enclosed

¹⁶⁴ John Bailey and George Culley, *General View of the Agriculture of the County of Northumberland*, 29-36, 43-45 (1794), and 1797 ed. (Newcastle), p. 62-80.

¹⁶⁵ Rev. Richard Warner, *A Tour through the Northern Counties of England*, 2:8-10 (1802).

¹⁶⁶ Mrs. Gaskell, *Sylvia's Lovers*.

¹⁶⁷ Bailey and Culley, *General View . . . of Northumberland*, 37-46 (1797).

¹⁶⁸ Mills, *New and Complete System*, 1:80.

¹⁶⁹ Ernle, *English Farming, Past and Present*, 226.

¹⁷⁰ Ellis, *Practical Farmer*, 19-20.

¹⁷¹ Young, *Six Months Tour*, 2:428-456.

¹⁷² Joseph Granger, *General View of the Agriculture of the County of Durham*, 38-47 (1794).

¹⁷³ Rev. William MacRitchie, *Diary of a Tour through Great Britain in 1795*, p. 134, 136 (1897).

in the past fifty years had been brought under the plow, the rotation being three years tillage and three years grass, but the courses varied to meet the requirements of the soil. As a preparation for wheat the fallow was dunged, but liming of the old arable lands had been abandoned. Much more maslin than wheat was still grown, the proportion of the rye mixed with the wheat seed varying between 1 to 7 and 7 to 1. Turnips, beans, peas, tares for soiling horses, and rape were all grown at that time. There were only a few cabbages, but potatoes for export had been grown "for upwards of eighty years" at Hamsterly in the parish of Witton-le-Wear. Clover was sown with either wheat or barley, and ray grass was general. Paring and burning was still the method of breaking up old grass land. The farms averaged from 150 to 50 acres in size, and many were much less, but there were a good many of 150 to 400 acres and some larger, so there was a wide variation. The swing plow was invariable, but it had a moldboard of cast iron instead of the older type of wood. A new paring plow had been introduced in one locality, the harrows were of the usual types, and the rollers of wood, stone and cast iron. Drills were used by the principal farmers, and by 1810 threshing machines were almost general, although the first had been erected by Robert Colling so lately as 1795. Wagons were unusual, carts drawn by two or three horses and single horse carts being the means of transport.¹⁷⁴

YORKSHIRE

When dealing with Yorkshire it would be desirable to consider each Riding separately, but this is not always possible because some of the comments made refer to the county without a definite reference to the particular district in which the process described was practiced. An early remark of this sort is that claying was practiced in Yorkshire, apparently for the purpose of bringing sandy land, only capable of bearing rye, into use for barley, oats, and peas.¹⁷⁵ This may have been in the East Riding, where, in spite of the great morass, some early improvements had taken place by 1739, wheat, rye, barley, beans, and oats all being grown, and much clover having lately been cultivated. Hemp and flax were also successful here, but the land was fallowed every third or fourth year.¹⁷⁶ This is confirmed by a description of the management of a 500-acre farm, rented at £220. Only 100 acres were arable, 250 were in pasture, and 150 were put up for hay. The management of the arable was to lay two years' dung on the 30 acres fallow and to sow 20 acres of wheat, 15 of barley, 5 of rye, and 25 of oats. At most three crops were taken before the land was fallowed.¹⁷⁷

Around Halifax the manufacturers had small farms, each keeping a cow or two, but Defoe observed that they grew little grain and produced little meat, their necessities in the one being obtained from Lincoln, Nottingham, and the East Riding, and of the other from the North Riding and generally from the surrounding country.¹⁷⁸ The whole parish however was "a Circle of twelve Miles Diameter, like a planted Garden, or a Colony, where every Family lives, as it were, within it self and by it self."¹⁷⁹ Such a district in

¹⁷⁴ John Bailey, *General View of the Agriculture of the County of Durham*, 67, 73-83, 97-183 (1810).

¹⁷⁵ Switzer, *Iconographia Rustica*, 3:215.

¹⁷⁶ *Annals of Agriculture*, 21:208-209.

¹⁷⁷ R. B., *Society of Improvers in the Knowledge of Agriculture*; William MacKintosh, *A Treatise Concerning the Manner of Fallowing of Ground*, 50 (Edinburgh, 1724).

¹⁷⁸ Defoe, *Tour*, 3:145.

¹⁷⁹ Richard Bradley, *The Gentleman and Farmer's Guide for the Increase and Improvement of Cattle*, 43 (1729).

this county has been aptly described by Oliver Goldsmith. "The place of our retreat was in a little neighbourhood consisting of farmers, who tilled their own grounds, and were equal strangers to opulence and poverty. As they had almost all the conveniences of life within themselves, they seldom visited towns or cities in search of superfluity."¹⁸⁰ In this Riding there was "plenty of meadow grounds and pasture . . . near the Ouse is a rich soil producing Wheat and Barley, tho' not in so great plenty as Oats, which are cultivated with success even in its worse parts."¹⁸¹ Enclosure of the moor, probably for alternate husbandry, was also going on. In 1733/4 a piece of land was enclosed by James Fretwell, and in 1750 his brother purchased some common land for £650 which proved a dear bargain on account of the expenses involved in enclosing, draining, etc.¹⁸² Between Durham and Guisborough in Yorkshire, rent was about 12s. an acre in 1770, the annual rental of the farms in this district ranging from £20 to £200 and the average being about £100. Near the large towns of York, Leeds, Doncaster, and Sheffield, rents were higher and the farms smaller, while the land from 30 to 40 miles east and southeast of York was described as fine farming country. The Yorkshire Wolds were of a piece with those of Lincoln, producing great quantities of barley and good grass for sheep. At that time these wolds were being rapidly enclosed, and the land was said to be good for sainfoin.¹⁸³ On the High Wolds oats and barley were principally cultivated, but in the open field the practice was one crop and fallow, while in some places only one crop was taken, the land then being allowed some years rest. The alternate husbandry permitted the same crop to be grown continuously, but was good for wheat, oats, barley, and rye. The result of the enclosures of the Wolds under such a system certainly would, as Alexander Hunter said, produce a greater quantity of grain for a few years than formerly, but it was not necessarily a permanent increase. On the limestone lands of the county rape dust was used for manure at the rate of four quarters an acre for wheat, three for barley, etc., but in Hunter's opinion it was too dear, and he recommended that shambles blood and sawdust should be substituted for it.¹⁸⁴

Young passed through the county at this time. Near Doncaster the farms were small, their annual rent being only £20 to £40 but a four-course rotation was practiced on the light land. Between Doncaster and Rotherham the course was fallow, barley, beans, and wheat; and some cabbage experiments had been started near the latter town. In the neighborhood of Barnsley farms were sometimes larger, the maximum rent being set at £80. The rotation was fallow, wheat, clover, wheat or fallow, wheat, and oats. Thence to Wakefield, Leeds, Tadcaster, and Winmoor where there was "much oatbread" which shows that this crop was prevalent. At Kiddell, Young saw mixed horse and ox teams, and at York, large quantities of potatoes sown in open fields. Near Beverley fallow, wheat or rye, or barley, oats or beans was the order of rotation of the day, but there were some turnips, and lime was used on the lands newly broken up by paring and burning. Oxen were used here, and it had been found that clover for long leys on new lands was a failure. Towards Hull, he saw great quantities of beans in open fields, and at Cottingham, great quantities of potatoes. The land between Cottingham and

¹⁸⁰ *The Vicar of Wakefield*.

¹⁸¹ Simpson, *Agreeable Historian*, 3:1103 (1746); *A New Present State of England*, 1:268 (1750); *Description of England and Wales*, 10:133 (1769).

¹⁸² Diary of James Fretwell, in Surtees Society, *Yorkshire Diaries*, 1:212, 232.

¹⁸³ Charles Varlo, *A New System of Husbandry*, 3:115-122 (York, 1770).

¹⁸⁴ Alexander Hunter, *Georgical Essays*, 1:23, 104, 109 (York, 1803). Cf. Francis Forbes, *The Extensive Practice of the New Husbandry*, 118-122 (1778).

Hull, however, required draining. Manure was brought out of Hull for a distance of 9 or 10 miles around the town and in some places four horses abreast were used on the plow. At Stillingfleet, Selby, Fuforth, and Nabourn, the rotation varied between three and four courses, but at the latter teasels for cloth manufacture and potatoes were cultivated. The pastures were laid up in high ridges and consequently poisoned with water. In Holderness the open fields were cultivated under a fallow and crop system, but the enclosures were under the four-course system. Here some flax was grown, and lime and rape dust were used for manure. The Marquis of Rockingham had set a splendid example of improvements near Rotherham, and there were other farmers who were making innovations between Doncaster and Pontefract. Among other crops licorice was grown near Pontefract, and maslin and rye flourished in the North Riding. In the attempt to summarize Young's description, there is grave danger of drawing a distorted picture; but the farming of the whole county was something like what has already been described. Turnips were by no means usual in many places, though grown in some. On the small farms which preponderated in the county, there were a few improved courses, and the moors, where they were broken up at all, were still under the alternate system.¹⁸⁵ The small farms used by the manufacturers around Halifax for subsistence farming were noted again in 1775. The soil was naturally barren and required constant tillage, marl being brought many miles on horseback to fertilize the land, but since the River Calder had been made navigable it was brought by water, a cheaper means of transport.¹⁸⁶ The Forest of Knaresborough was enclosed before 1777, and the land, previously of little use, was converted into arable and good pasture.¹⁸⁷ Twenty years later when Young visited it, only three farmhouses had been built and 400 acres divided, the balance of 5,000 acres enclosed remaining in its primitive state of ling or peat. Some oats were grown, but the land was really no good for corn and was given up to grazing.¹⁸⁸

Marshall has left a very complete description of the farming in the Vale of Pickering, and he represented it as covering the agricultural economy of the whole county in 1788. Half the Vale had been enclosed within his memory by exchanges and transfers of land, although some enclosure had been made by Act of Parliament, and the holdings were divided among small proprietors. The farms in the Wolds were larger as were those in the eastern marshes. Formerly the four-ox plus two-horse plow had been used, but in his time it had been replaced by a two-horse plow. The produce of the Vale was grass and corn, but the area devoted to tillage was diminishing. Rape was widely cultivated and oats, barley, and pulse were of sufficient quantity to permit export, but he found nothing to remark on about the tillage. The alternate husbandry was practiced in the moors, the land being broken up by paring and burning. The manures were dung, lime, and ashes, the last chiefly in the moorlands. There was no drilling.¹⁸⁹ In this Riding also, the practice of claying light sandy land has been noted.¹⁹⁰

This account of the crops of the North Riding toward the end of the century was not much developed by John Tuke, who wrote both editions of the county report. The course then was fallow, wheat, oats, sometimes beans and peas, or these crops mixed and

¹⁸⁵ Young, *Six Months Tour*, 1:108-358.

¹⁸⁶ Rev. John Watson, *History and Antiquities of the Parish of Halifax*, 8 (1775).

¹⁸⁷ William Bray, *Sketch of a Tour*, 271 (ed. 2, 1783).

¹⁸⁸ *Annals of Agriculture*, 27: 291-293 (1796).

¹⁸⁹ William Marshall, *The Rural Economy of Yorkshire*, vol. 1 (1788).

¹⁹⁰ *Considerations on Agriculture: Treating of the Several Methods Practiced in Different Parts of the Kingdom of Ireland, with Remarks Thereon*, 40 (Dublin, 1730).

known as blendings instead of oats. Oats were a continuous crop in Ryedale, while wheat was the staple product of Cleveland. Rye or maslin was cultivated in the light sandy lands, and barley was grown after turnips. Oats, however, were probably the preponderant cereal. Rape was extensively grown on pared and burnt land. Turnips were drilled in the north of the Vale of York, and largely in the dales and margins of the moors. Sainfoin was beginning to be grown. Dung, lime, kelp ashes near the coast, turf ashes in the moors, and composts were the manures, and paring and burning were practiced in every part. Among the less widely spread crops in 1800 were flax, vetches, lentils, mustard, and teasels. Few wagons were used in this Riding, two- or three-horse carts being usual, but there were also some one-horse carts, especially in the west, while on the eastern moors there were some small wagons. The first threshing mill was built in 1790, but this number had "greatly increased" by 1800, and the common wrights were beginning to make them. Winnowing machines were in general use, as was the Dutch plow. Some few Rotherham plows were, however, used and the power was provided by two horses abreast, except in the north where one additional horse was placed in front of the two. There were one or two turnwrest plows in use on the hillsides, and a few gripping plows were used to keep the furrows of grassland clean. A breast-gripping spade with both sides turned up like Blith's trenching plow of 1650, of which there is a drawing, was presumably serviceable for this purpose. Drills were not general, though there were several in the north and a few elsewhere. Both light and heavy harrows were used and a drag harrow for cleaning the fallow of couch grass. A stubble rake and a wooden hay sweep seem to have been indigenous to the county.¹⁹¹

In the East Riding long rotations had been introduced by the date of the first report, and at Hunmanby turnips and seeds figured in the course. Sainfoin was grown on the Wolds. The fold yard and stable manure were the principal fertilizers, and dung was brought by water from Hull. Soot, pigeon dung, and rape dust were also used, but the last was not so popular as it had been. Lime was still favored on the Wolds, and sea sand and weed were used on the stony clay.¹⁹² Young recorded that 40,000 acres had been drained in Holderness by 1797, and that 30,000 acres were then being attacked. Walling, draining, and enclosing had been very extensive about twenty years before, and the consequent improvement "uncommonly great, yielding vast crops of corn, rape, &c.," and having a good effect upon the health of the inhabitants, agues then being little known. In the district lying between Beverley, Hull, and Holderness there were still large tracts of marshy ground, much of it flooded even in the summer, in spite of these excellent improvements; but there were no commons and little or no waste near Hull.¹⁹³

Strickland, who wrote the second edition of the report in 1812, regretted some of the quasi-improvement. He thought that a great deal too much of the old sheep walk on the Wolds had been plowed up. Indeed, some of the oldest enclosures were then far less cultivated than before, but instead of being luxuriant pasture, as the sheep walk had been, it was little better than a desert waste. Naked fallows were still common, a few having tried to abolish them, unsuccessfully. On the old open fields of the west, the course was fallow, wheat, oats, fallow, barley, peas or beans, a "partially improved system of management." After enclosure the tenants were not permitted to take white crops in succession. The long rotations practiced on some farms were modifications of the Norfolk system.

¹⁹¹ John Tuke, *General View of the Agriculture of the North Riding of Yorkshire*, 32-37 (1794), and the 1800 ed., p. 78-167.

¹⁹² Isaac Leatham, *General View of the Agriculture of the East Riding of Yorkshire*, 40-55 (1794).

¹⁹³ *Annals of Agriculture*, 31:113-117, 148-149 (1798).

There was only a small quantity of rye grown by this date, but rape continued to be cultivated in Holderness. Turnips, which had been cultivated in the Riding for fifty or sixty years, were only just being cultivated in the approved manner. Sainfoin had been introduced by the Cabaldestone of Hunmanby some seventy or eighty years before, and potatoes were extensively grown in Holderness and Howden. Flax was grown in Howden and east of Derwent. Buckwheat, or brank, and cabbages for cattle and sheep feed, were also usual. Lucerne had only been tried by a few gentlemen. Strickland also commented on the drainage work, and remarked that under or hollow draining of the fields had been carried out on a great scale for many years past, while paring and burning had been in great repute. The manures were dung; lime, used in Holderness and Howden and supplied from the Doncaster district of the West Riding; seaweed compost; bones; soot; and chalk. Both wagons and carts were found there, and in the south and west of the Riding the Rotherham was the common plow, but in the Wolds the old foot plow with a short straight wooden moldboard often requiring three or four horses to draw it was used. If four horses were necessary they were harnessed two abreast and driven with "strings." The gripping plow was also found useful. The peas and bean hook was said to have been peculiar to the East Riding. The first threshing machine had been erected some twenty-five years before and they were very general in 1812.¹⁹⁴

By 1794 the most common course in the West Riding was the Norfolk; turnips, barley, clover, and wheat. Sainfoin was grown in Tadcaster and Ferrybridge. There was little rye grass sown, and, although turnips figured in the rotations, their culture was poor. Winter tares were sown in many places, and flax along the Ouse. Practically all the arable was enclosed by the stone walls which still prevail. The manures were the universal dung and lime, but the latter was "faultily done." Bone, horn shavings, and rape dust were also used. There were some watered meadows near the rivers, and paring and burning on the moors. The farms here were generally small, but some were 300 acres and over, and the size of the holdings was said to be an obstacle to improvement. The arable was, as is to be expected, in the east of the county, the western mountains and moors being given up to grazing.¹⁹⁵

The second edition of the report was published only five years after the first and was written by Robert Brown who assisted in the earlier survey. It will be interesting, however, to notice the division made in the rural economy of the Riding. From Ripley to the western extremity the land was kept under the grazing system and seldom or never plowed, while grain was raised on the inferior or moorish soils, the highest grounds being generally common. The land adjoining the manufacturing towns was in the very small farms kept by the manufacturers. The area east from Ripley to the East Riding was principally employed in raising corn, and there were still scattered common fields east of the Great North Road from Doncaster to Boroughbridge. Brown joined issue over the fallow controversy and defended the practice under certain conditions. He also gave details of the management of several farms. Wheat was grown to a great extent in all the low lands, no great quantity of rye being cultivated. He estimated that double the area under barley was devoted to wheat. Oats, beans, peas, tares, and vetches were usual crops. The system of growing turnips was deficient in spite of their widespread cultivation. Potatoes were grown to a considerable extent in the east of the Riding and more

¹⁹⁴ H. E. Strickland, *A General View of the Agriculture of the East Riding of Yorkshire*, 82 ff., 105-164, 194-204 (York, 1812).

¹⁹⁵ George Banks Rennie, Robert Brown, and John Shirreff, *General View of the Agriculture of the West Riding of Yorkshire*, 19-31 (1794); *Annals of Agriculture*, 22:409-412 (1794). Cf. Aitkin, *Description*, 92 ff.

or less over the whole. The implements in this Riding were similar to those in the others. The Rotherham plow was the most common, and carts and wagons of various dimensions were used. There were a few threshing machines, built on Meikle's plan.¹⁹⁶

DERBY AND NOTTINGHAM

Derby, by reason of its physical configuration, was always largely devoted to grazing; the main cereal crop in the early part of the century was oats,¹⁹⁷ barley being produced where possible for the breweries. The enclosures in the valleys where corn or meadow was plentiful were made with the dry stone walls called by the inhabitants hedges, a familiar feature of all the northern counties.¹⁹⁸ Young, however, was the earliest writer to record any material information about the country. It is clear that the spirit of improvement was not excessively active, and this may have been because the holdings were small, or for other reasons.¹⁹⁹ Near Derby itself, Young found new arable enclosures under the open-field course of fallow, wheat, beans, or peas. There were some turnips. The Norfolk course had been introduced by Wenman Cooke and it was practiced south of the Trent. From Derby to Matlock the county was all enclosed, and Rotherham plows were used. Thence to Chatsworth the land was similarly enclosed, and paring and burning was the method of breaking up old turf. Wheat was cultivated between here and Tiddswell after the land had been limed. There was, moreover, improvement of pasture in the Peak. Between Middleton and Chesterfield there were only a few reclaimed corn-fields, but in the neighborhood of the last town a lengthy course, including two fallow years, was observed, while the swing plow was the ordinary implement.²⁰⁰ The alternate husbandry was prevalent in the hills, where oats was the only corn sown. It was grown for three years in succession if the land was in good condition, but, if not, only for two, and then the land was laid down. Formerly when they broke up new grass, it was only limed, but in 1777 it was also pared, burnt, and plowed for turnips, followed by oats and grass seed. Some farmers limed after laying down, but others in the turnip crop. The Duke of Devonshire had made extensive improvements by clearing woodland and plowing.²⁰¹ Another gentleman, Colonel Pool, was said to plow as much ground with three oxen as the neighboring farmers did with four or five horses.²⁰² The reports do not indicate that very much change had taken place by the end of the century. Thomas Brown, a defender of fallows, said that the long rotation, a modification of two courses of the Norfolk system, was in use, but that "these strong clays" were still under the open-field three-course system. In the Low Peak, a seven-course rotation followed by grass had been adopted, but in the High Peak a succession of oats was taken before the land went back to grass. Camomile was grown near Chesterfield.²⁰³

¹⁹⁶ Robert Brown, *General View of the Agriculture of the West Riding of Yorkshire*, 52-59, 77-79 (Edinburgh, 1799). Cf. John Housman, *A Topographical Description of Cumberland, Westmorland, Lancashire . . .*, 171 ff. (Carlisle, 1800); Warner, *Northern Counties*, 1:200-280.

¹⁹⁷ Ellis, *Practical Farmer*, 18.

¹⁹⁸ R[esta] P[atching], *Four Topographical Letters Written in July 1755*, 23 (Newcastle-upon-Tyne, 1757).

¹⁹⁹ Ernle, *English Farming, Past and Present*, 199-200, 227, 294.

²⁰⁰ Young, *Farmer's Tour through the East of England*, 1:150-234.

²⁰¹ Bray, *Sketch of a Tour*, 200.

²⁰² Henry Home, Lord Kames, *The Gentleman Farmer*, 28 (Edinburgh, 1776).

²⁰³ Thomas Brown, *General View of the Agriculture of the County of Derby*, 15-29 (1794). Cf. Aitkin, *Description*, 69 ff.; Warner, *Northern Counties*, 1:174; John Hutchinson, *Tour through the High Peak of Derbyshire* (Macclesfield, 1800).

The second edition of the report appeared in 1815, and the methods of cultivation described were much the same. The county was not famous for wheat, and it grew very little rye. Oats were the main cereal, and more beans than peas were grown. Turnips were fed off the land by sheep, and cabbages were also cultivated for sheep. Potatoes were grown for human food. High farming, as it was then understood and practiced by such men as Samuel Oldknow, included this crop in its rotation.²⁰⁴ Practically no marling was done, but liming was general in the Peak, while bones were shipped from London and ground into manure locally. Town and yard dung also formed a standby. The plows, though of various types, were mainly wheeled; the usual harrows were used, but John Farey, the county reporter, saw one bush harrow. Rollers were either of wood or stone, and there was not much drilling, less indeed in the opinion of Farey, than there should have been. He thought that the spread of threshing mills had been considerable and gave a list of twenty-one owners. Wagons were used in the south and carts in the hills.²⁰⁵

The topographers divided Nottingham into two parts, the east, which was fruitful, yielding plenty of grass and corn, and the west, which was not, being the Sherwood Forest, and in some places barren of everything except coal. It was even said in 1750 that enclosures "tend to improve all other Parts of the Kingdom, yet here they have a quite contrary Effect."²⁰⁶ Young found Sherwood Forest the first large and continuous tract of waste land after he left Bradfield on his northern tour, but between Newark and Tuxford he had seen mostly enclosures under turnips, barley or oats, and rye, while at West Drayton, the Norfolk system had been adopted.²⁰⁷ Approaching the town of Nottingham he found the land mainly enclosed, but employed in grazing. By Newstead to Mansfield the Forest was all waste, but in Young's opinion improveable.²⁰⁸

Robert Lowe was responsible for both editions of the report on the county, and also for an essay in the *Annals of Agriculture*. In the enclosures which had by that time been made in the Forest, the Norfolk course, sometimes with an extension of the ley, had been adopted and some potatoes were grown. On the banks of the Trent, the turnip husbandry, as the Norfolk system, was sometimes called, was usual. There was, however, more grass than arable, and the alternate husbandry was practiced here as in some parts of the Forest. Licorice was grown near Worksop and hops at Redford. The Vale of Belvoir was partly open and partly enclosed and mixed farming was practiced. Dung was the usual manure, though lime was put on the fallows for turnips, bone dust had been tried, and rape dust, green manuring, and malt combs had been used. Gypsum and compost were also known. Lowe had seen clover in a common field at Oxtun, but the three-course system was usual. He thought the value of the land had been increased by enclosure, and that, with an increased population in the Forest, on the clay it had been maintained because a portion had always been kept in tillage. The Dutch swing plow was generally used, but one- and two-wheeled types were not unknown. The harrows were of various patterns according to the soil on which they were used, and two threshing machines were recorded. Wagons were general, few carts being seen.²⁰⁹

²⁰⁴ George Unwin, *Samuel Oldknow and the Arkwrights*, 204-214, especially p. 205, (1924).

²⁰⁵ John Farey, *General View of the Agriculture of Derbyshire*, 2:43-59, 94-155 (1813).

²⁰⁶ *Present State*, 1:180.

²⁰⁷ Young, *Six Months Tour*, 1:97-102.

²⁰⁸ Young, *Farmer's Tour through the East of England*, 1:135-140.

²⁰⁹ *Annals of Agriculture*, 22:449-494 (1794); Robert Lowe, *General View of the Agriculture of the County of Nottingham*, 10-33 (1794), and the 1798 ed., p. 17-20, 21-37, 103-104.

CONCLUSION

The chief development in cropping during the eighteenth century was the slow spread of the Norfolk system to the arable land it suited, although it by no means became the general basis of tillage. Again, there were still large tracts of land which, if they were put to any use at all, were devoted to rough grazing, as indeed they still are. Young summed up these lands in 1773 by saying that he was clear that "there are at least 600,000 waste acres in the single county of Northumberland. In those of Cumberland and Westmoreland, there are as many more. In the North and part of the West Riding of Yorkshire, and in the contiguous ones of Lancashire; and in the west part of Durham are yet greater tracts; you may draw a line from the north point of Derbyshire to the extremity of Northumberland, of 150 miles as the crow flies, which shall be entirely across waste lands; the exceptions of cultivated spots very trifling. The east Riding of Yorkshire, Lincolnshire, Cambridgeshire, Dorset have large tracts; Devon, Cornwall and all Wales immense ones. . . . To these may be added a long catalogue of forests, heaths, downs, chases, and other wastes scattered through the other counties, and even within sight of the capital."²¹⁰ Even in counties like Kent, Norfolk, and Essex where the improved system had been generally adopted, it was still, in Young's opinion, confined to narrow limits.²¹¹ It was, nevertheless, known in other counties and was slowly spreading throughout the country and being modified to suit local conditions.

The counties which Young condemned for their large proportions of waste land were and had always been grazing counties. As early as 1729 Defoe made a list of the chief grazing counties, which included Sussex, Romney Marsh and other parts of Kent, the vale of Aylesbury and others in Buckinghamshire and Berkshire, the Isle of Ely, the Bank of Trent, the counties of Lincoln, Leicester, Stafford, Warwick, Chester, Somerset, and Lancaster, the North Riding and the Banks of Tees, and Bishopric of Durham. Essex, Huntingdon, Cambridge, Bedford, Buckingham, Oxford, Northampton, Lincoln, and Nottingham, however, produced abundant corn, although Defoe thought the prime of the lands were even then laid up for grazing as in Essex, Suffolk, and the Fens.²¹² The work of drainage of marshes usually allowed a crop of rape followed by oats and sometimes wheat to be taken, thus placing more of the land at least temporarily under tillage, while the alternate husbandry in outlying mountain and moor allowed some crops to be taken. The reclamation of the Wolds by paring and burning and liming seems to have extended the average acreage. It was, however, in those counties readily accessible by road or by sea to the great market of London that the most progress was made. The valley of the Thames was able to make use of the river as transport for bulky goods, as were the counties adjacent to the Severn Valley and the many rivers of Yorkshire. It was probable, however, that the improvement which took place in the century has not yet been accurately measured, and it cannot be said with assurance that the progress was not comparable to that made after the end of the wars in the early nineteenth century.

Many newly designed and improved implements, some of them quite impracticable, had been placed at the farmers' disposal, and some, like the Norfolk and the Rotherham plows, had been extensively adopted. The horse had definitely superseded the ox as the power unit, except in backward districts or where some gentlemen were trying to rein-

²¹⁰ *Observations on the Present State of the Waste Lands of Great Britain*, 37 (1773).

²¹¹ *Annals of Agriculture*, 2:95-96 (1784).

²¹² *An Humble Proposal to the People of England and the Encrease of their Trade*, 10 ff. (1729).

roduce the latter. It was not until a later period that engineering had made sufficient advance to permit the implements to be improved out of all recognition and to be really distributed. The varying skill and knowledge of the local smiths who made the implements was much more likely to be a hindrance to progress because they would, in the main, be tied to tradition. Perhaps the greatest invention of the eighteenth century was the threshing machine, and that was used only by the wealthiest and most advanced farmers.

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